

VOL. XXXVI. No. 7

JULY 1951

MECCANO

MAGAZINE

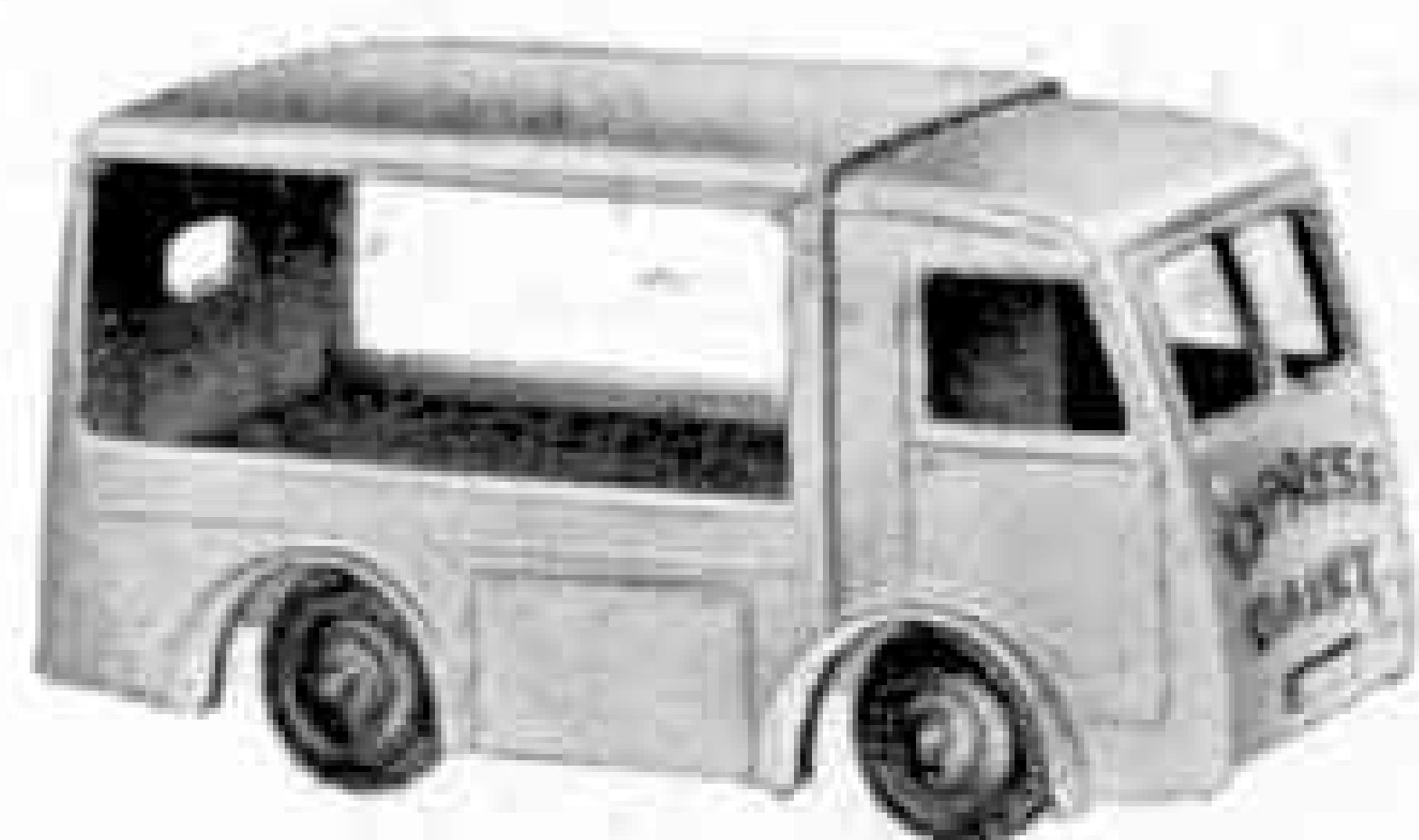


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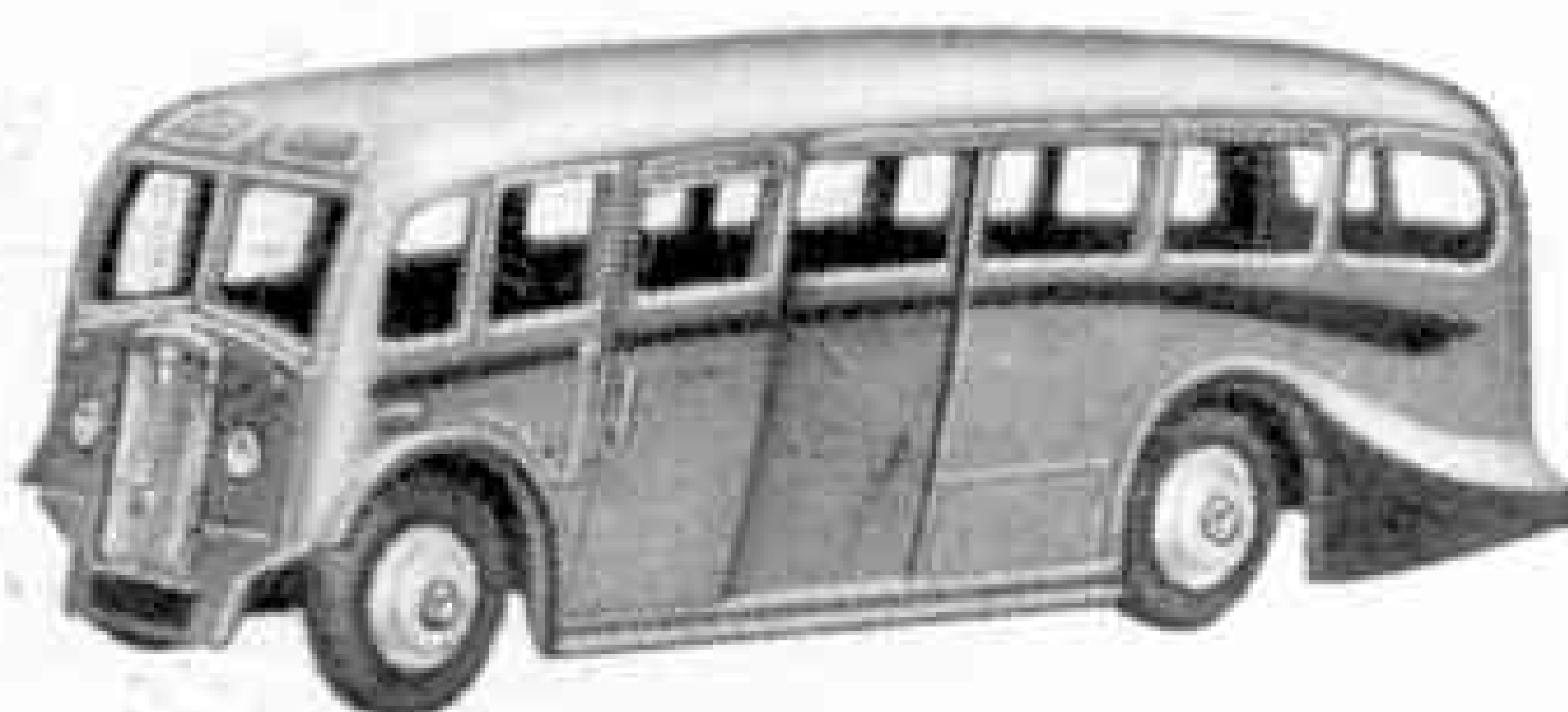
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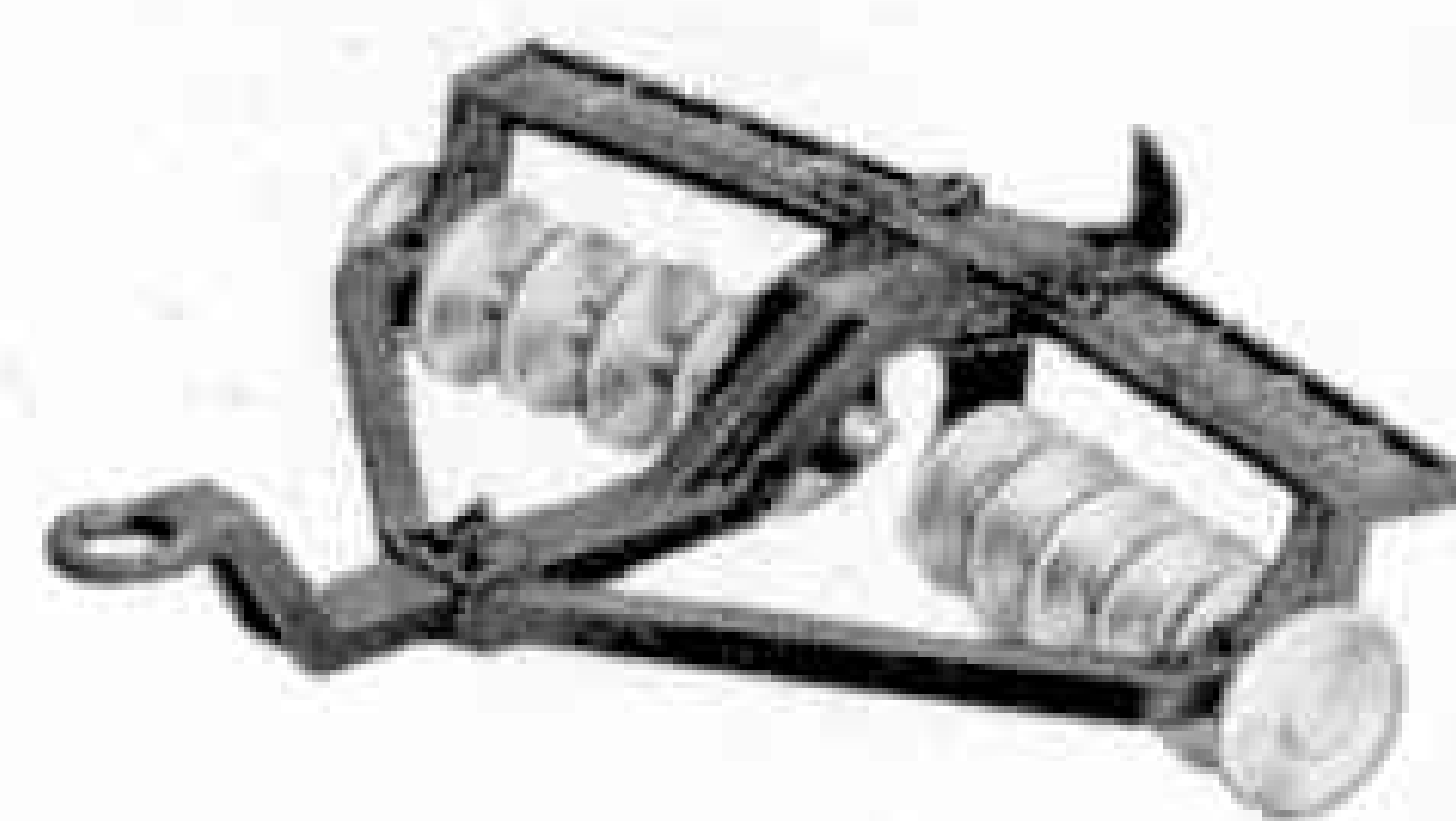
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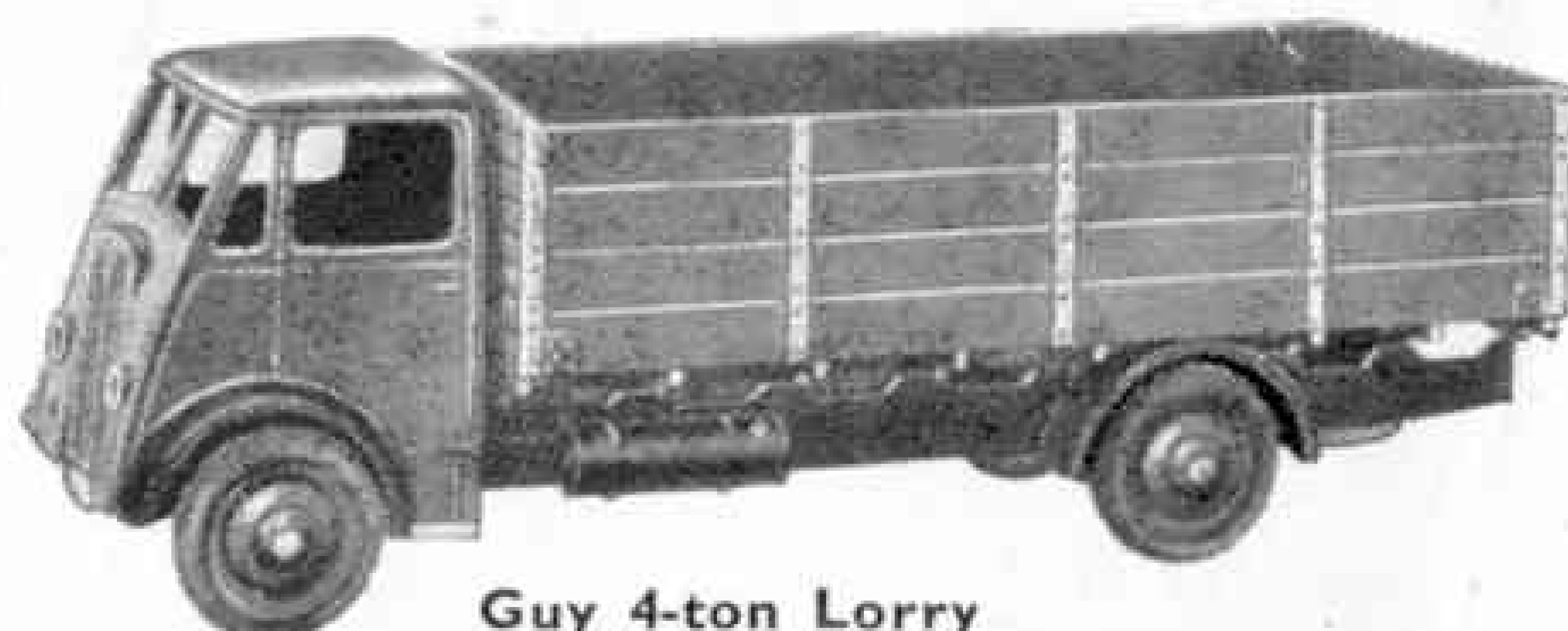
Luxury Coach
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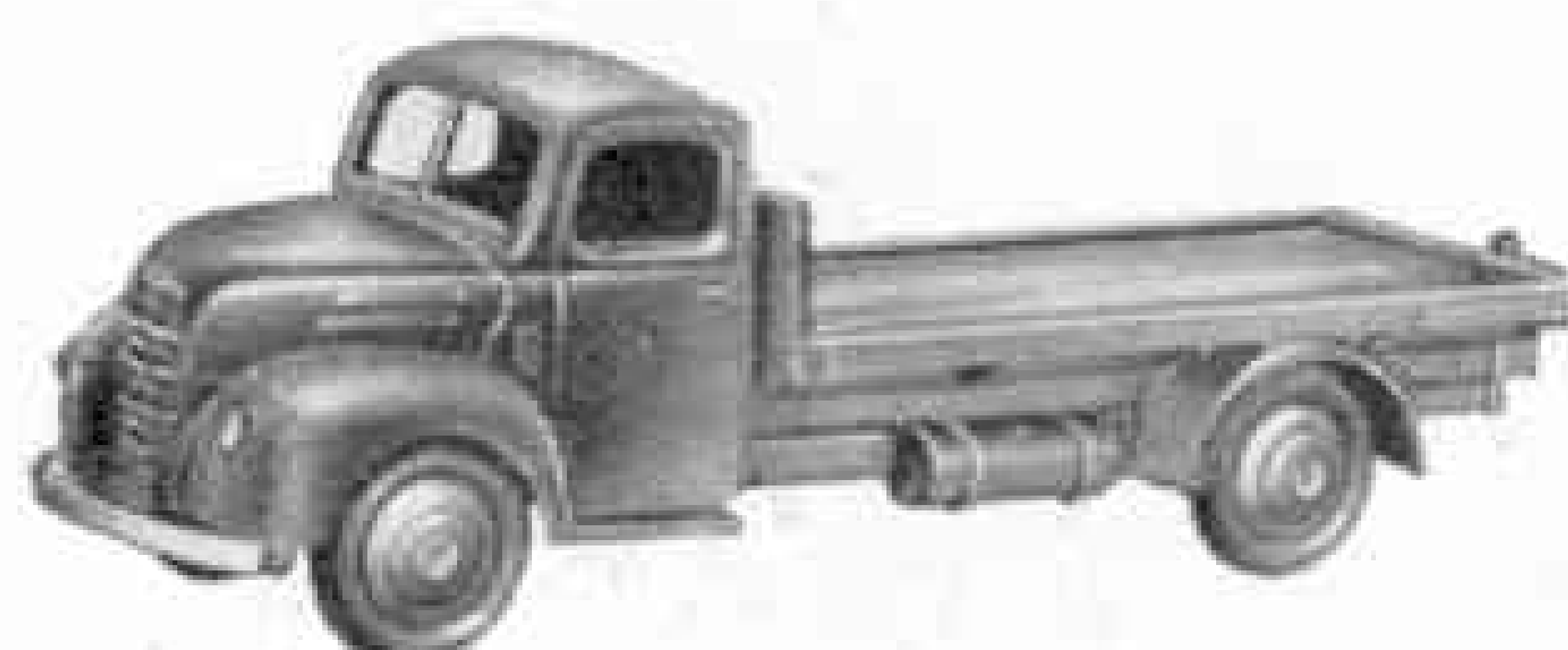
Disc Harrow
No. 27h



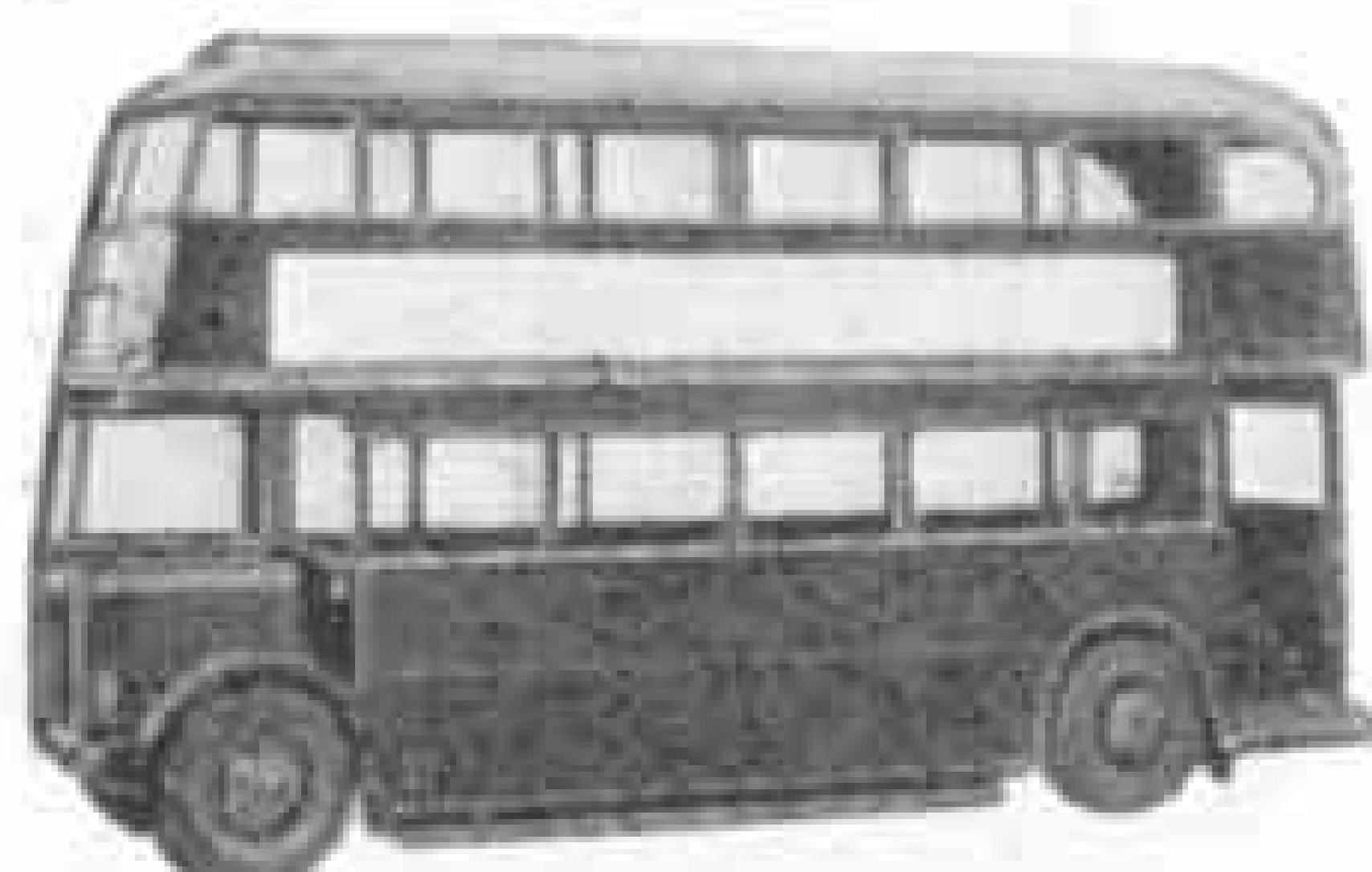
Observation Coach
No. 29f



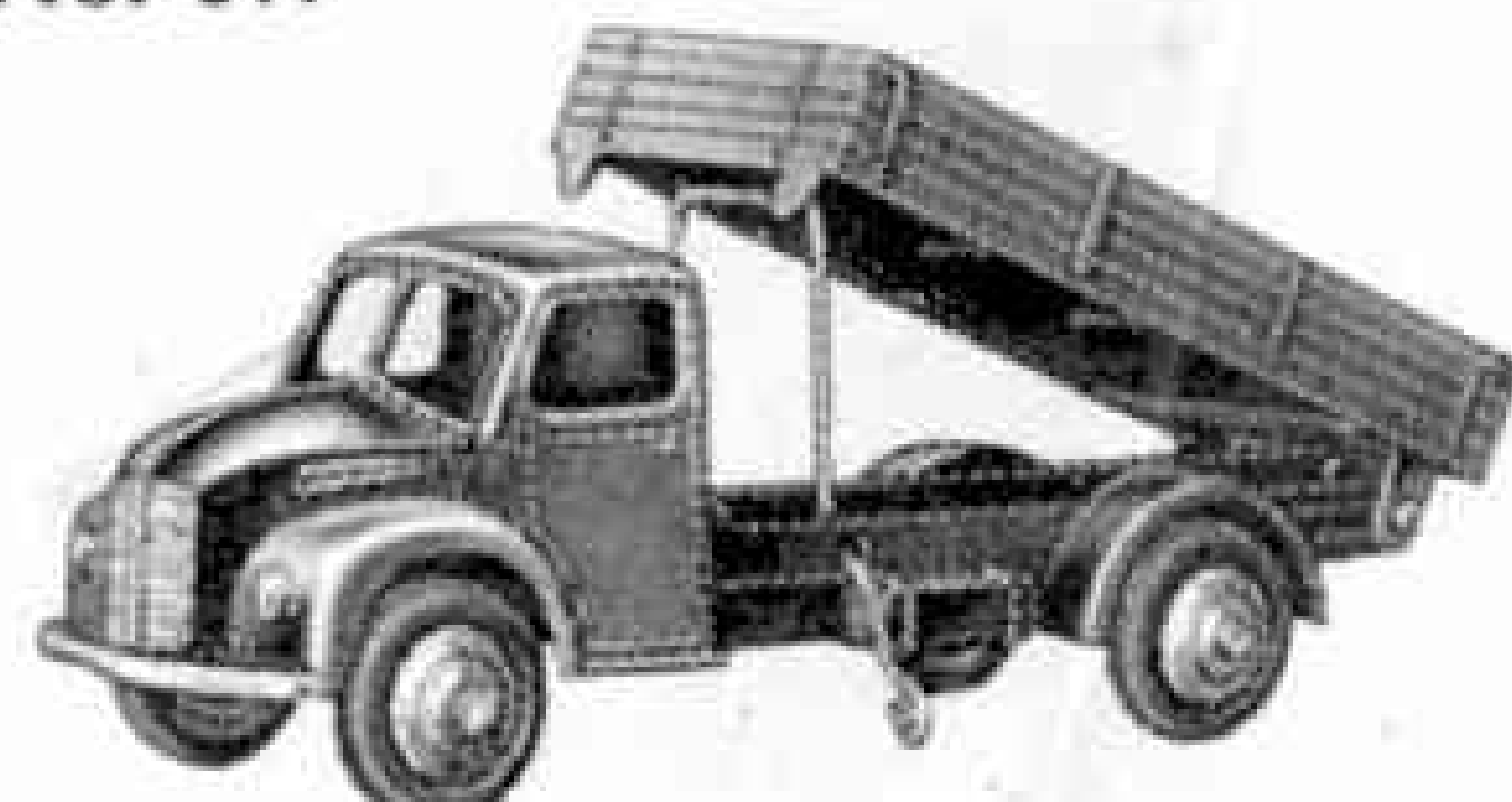
Guy 4-ton Lorry
No. 511



Fordson 'Thames' Flat Truck
No. 30r



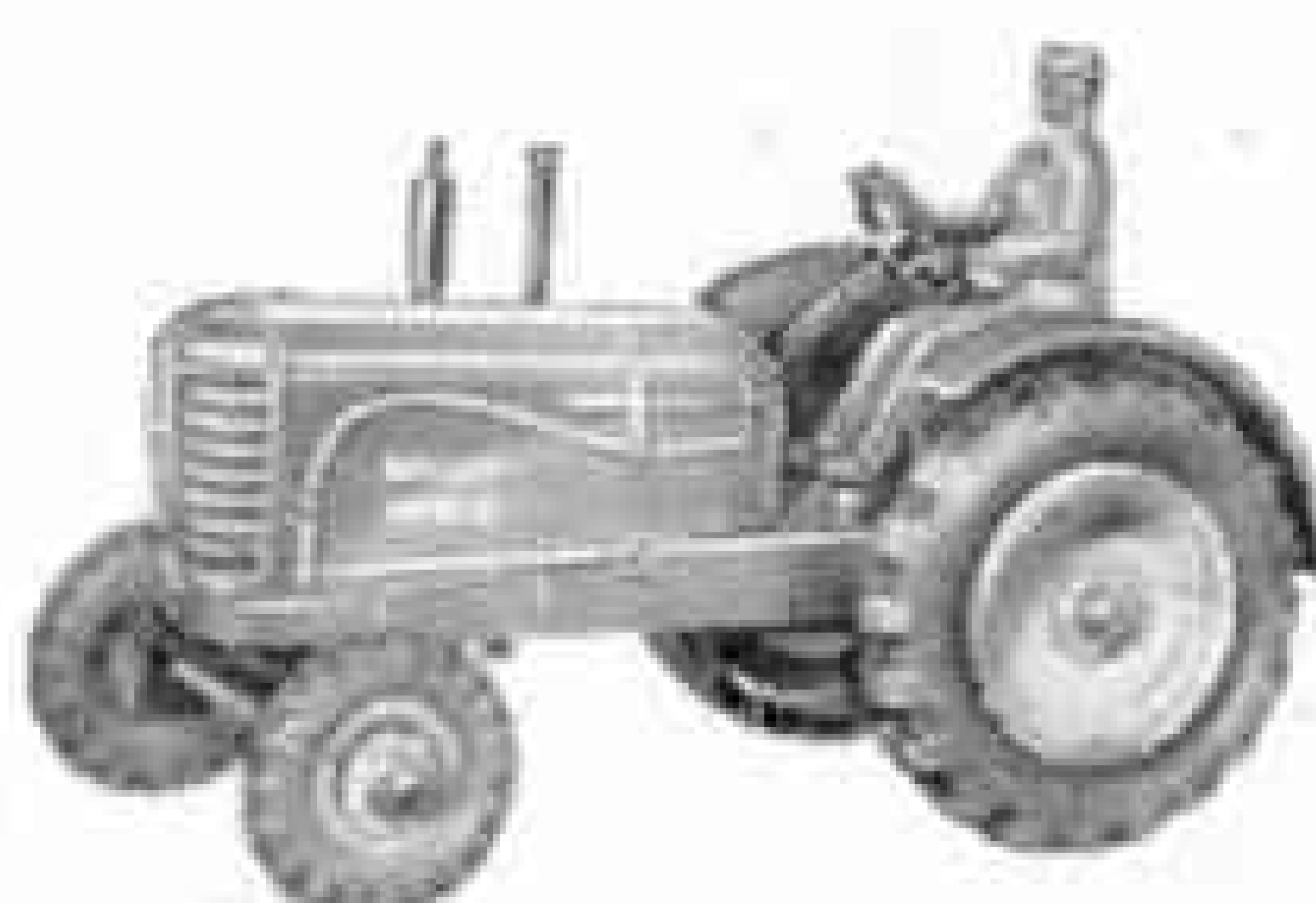
Double Deck Bus
No. 29c



Rear Tipping Wagon
No. 30m



Rover 75 Saloon
No. 140b



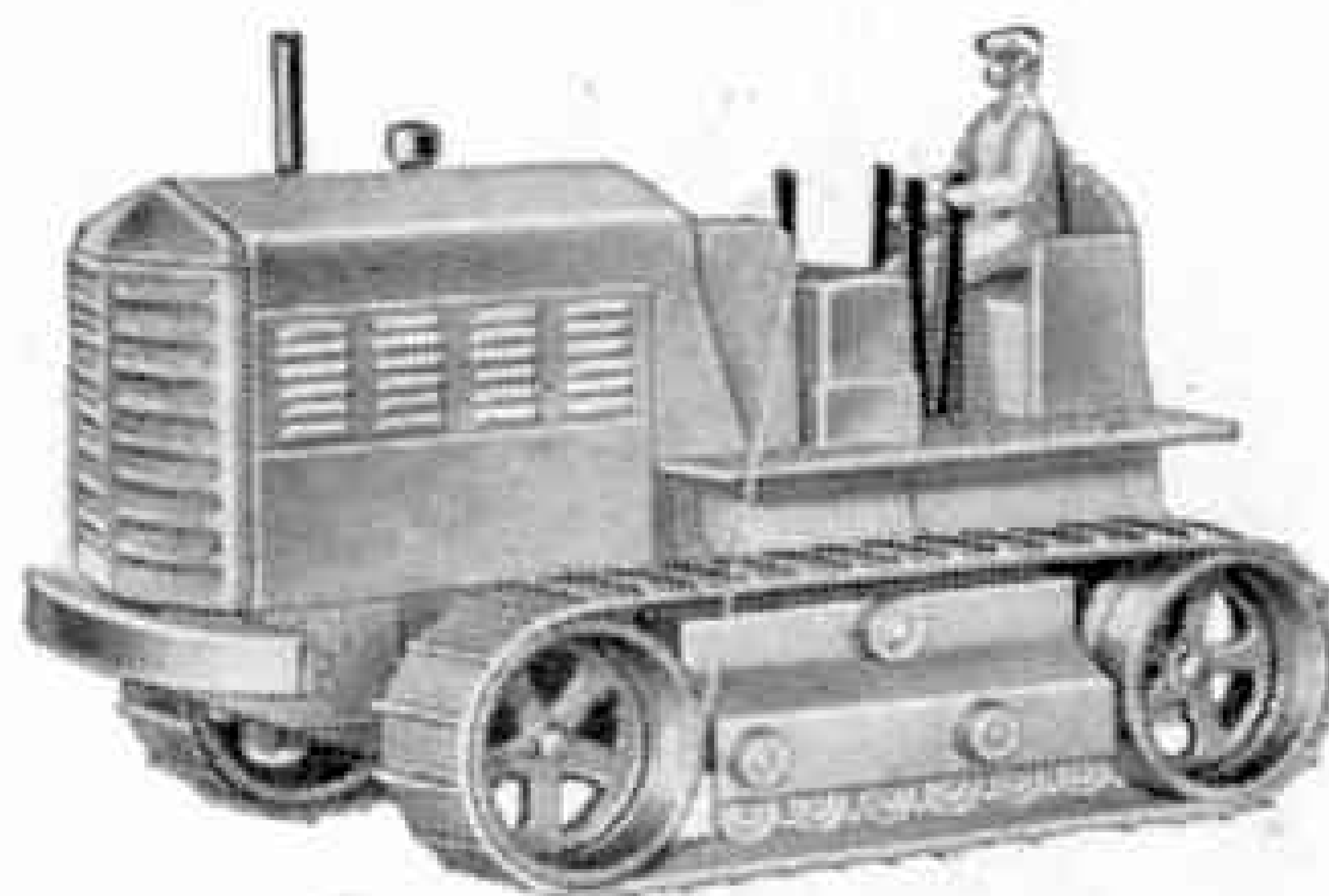
Massey-Harris Tractor
No. 27a



Austin 'Atlantic' Convertible
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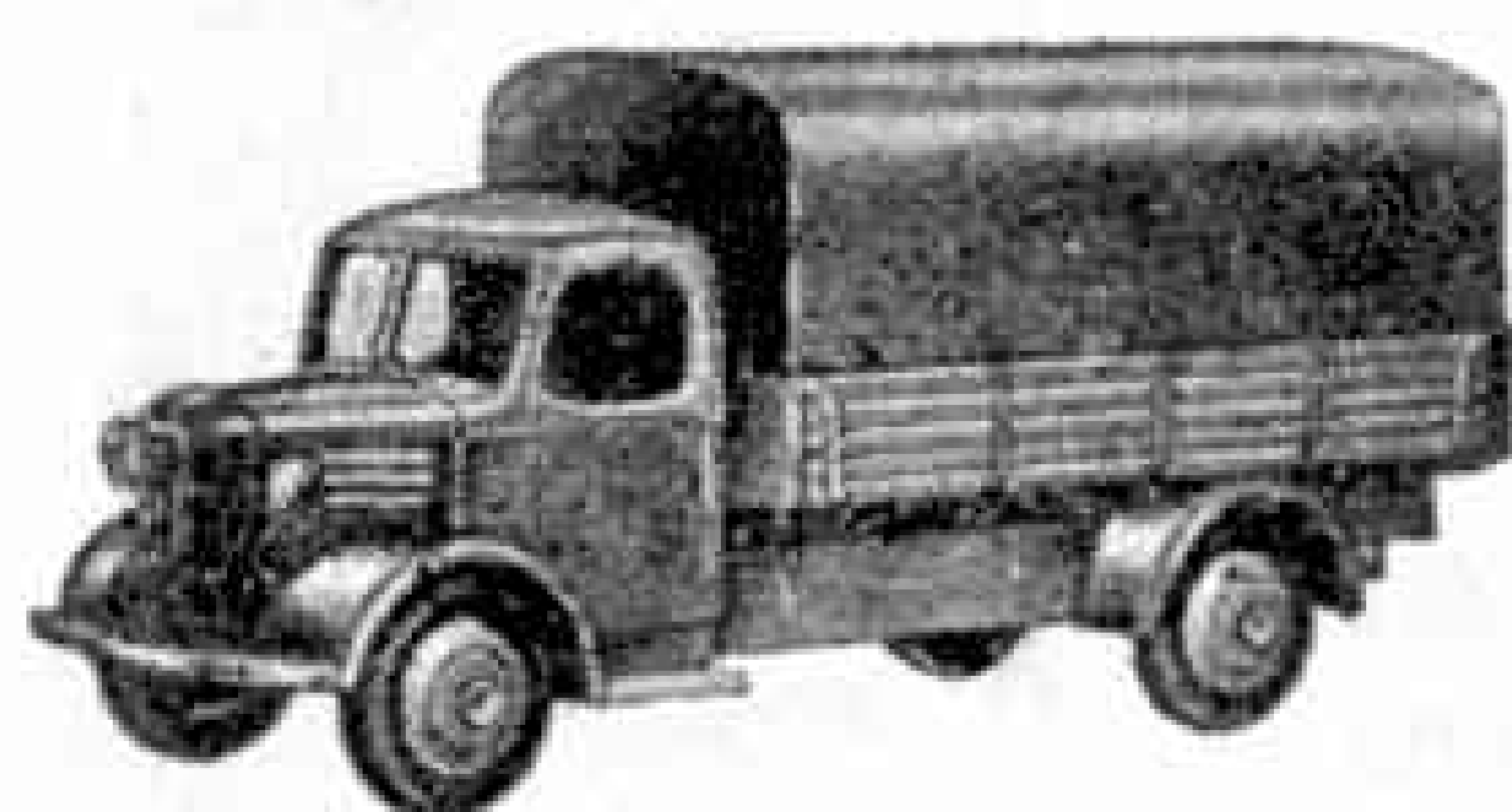
Coles Mobile Crane
No. 571



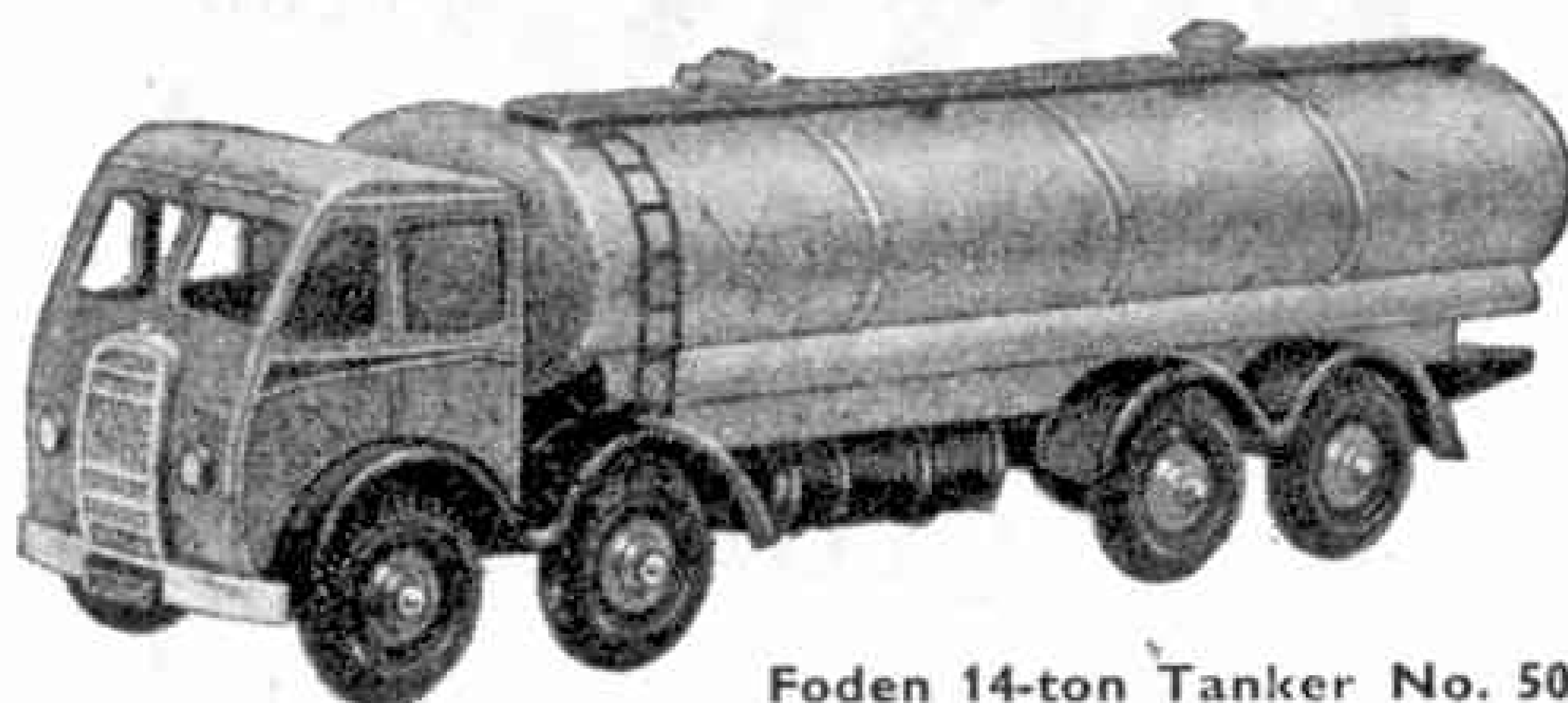
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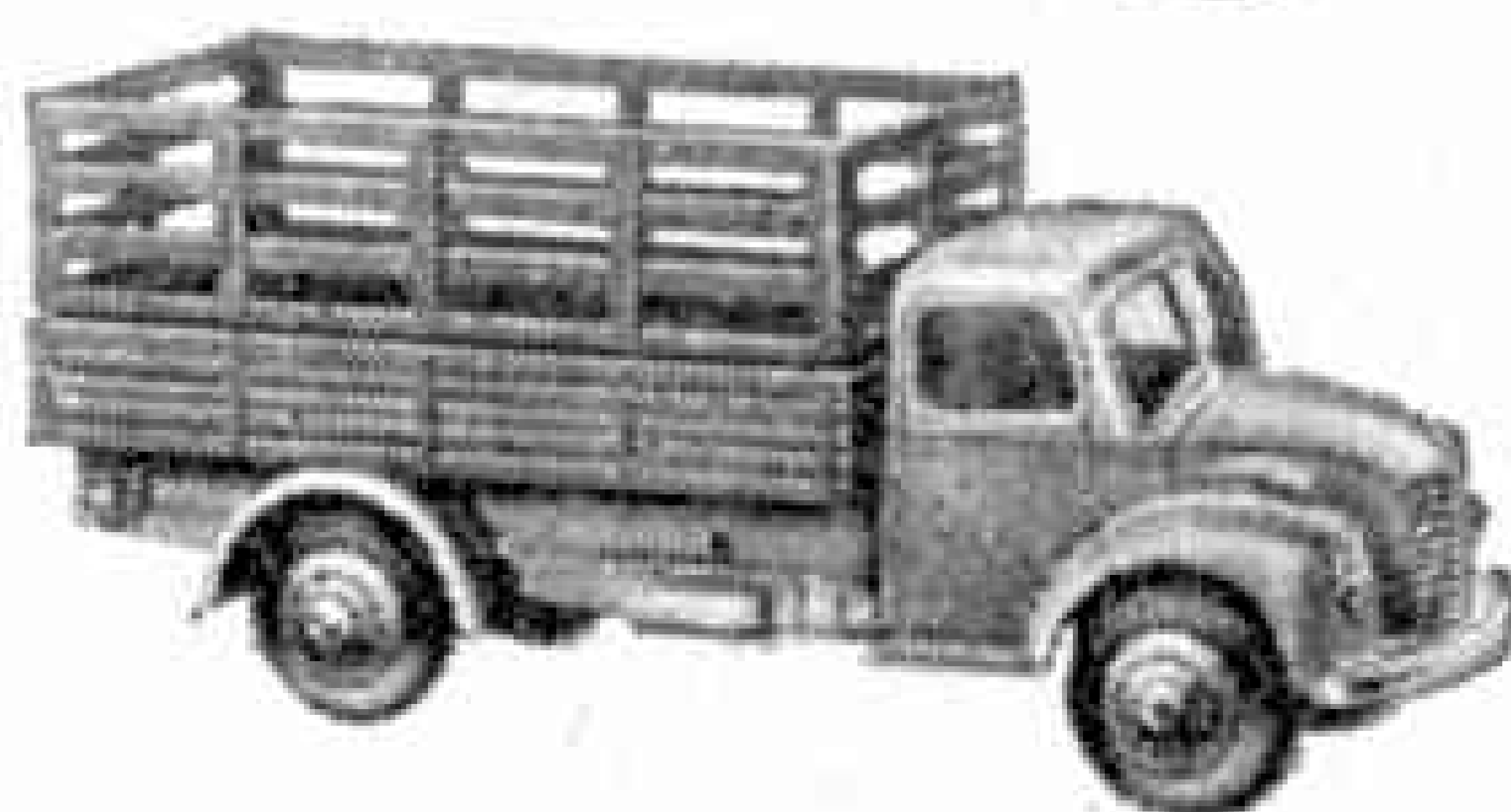
Austin Covered Wagon
No. 30s



Foden 14-ton Tanker No. 504



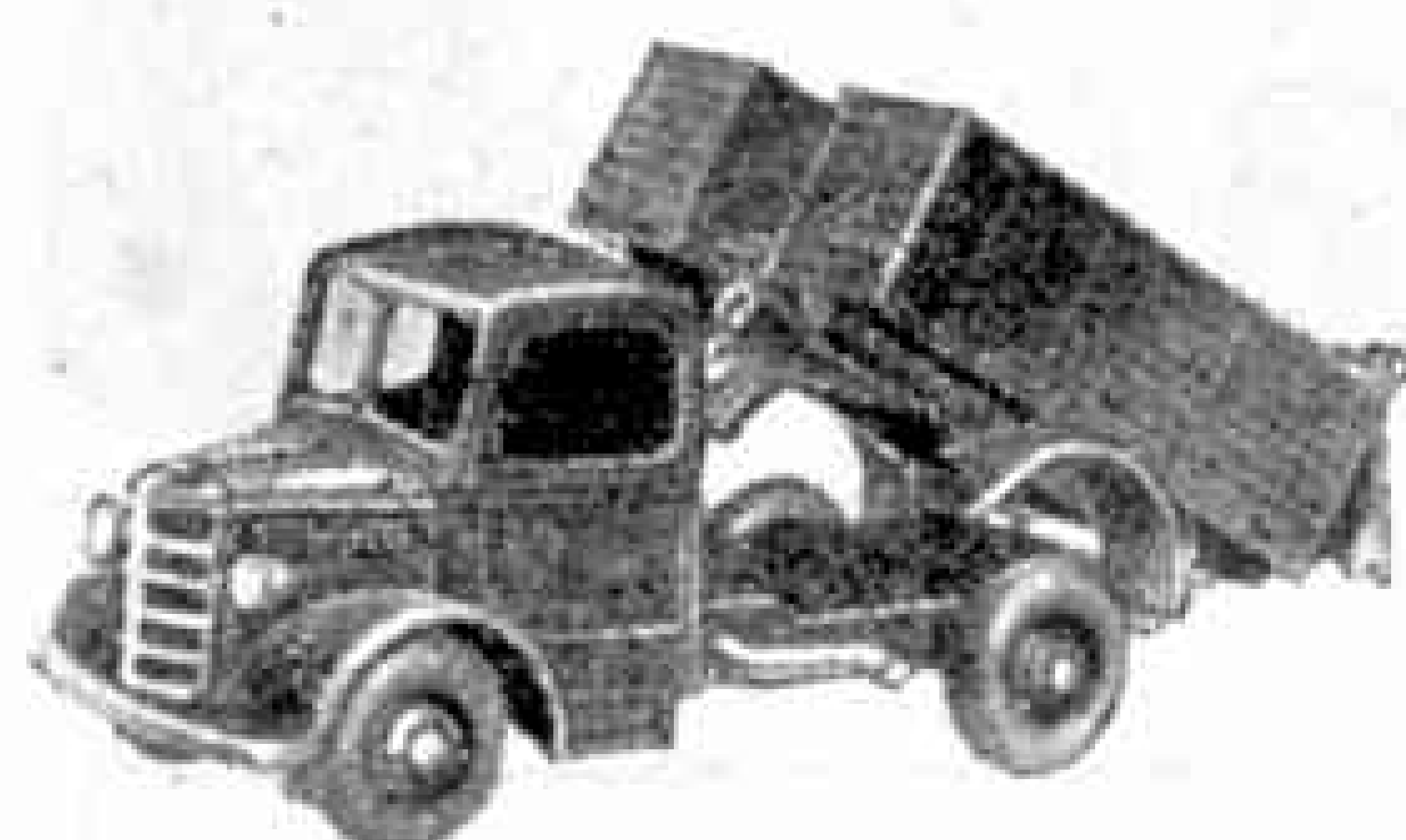
Hillman Minx Saloon
No. 40f



Farm Produce Wagon
No. 30n



Estate Car
No. 27f



Bedford End Tipper
No. 25m



Dumper Truck No. 562



Land-Rover
No. 27d



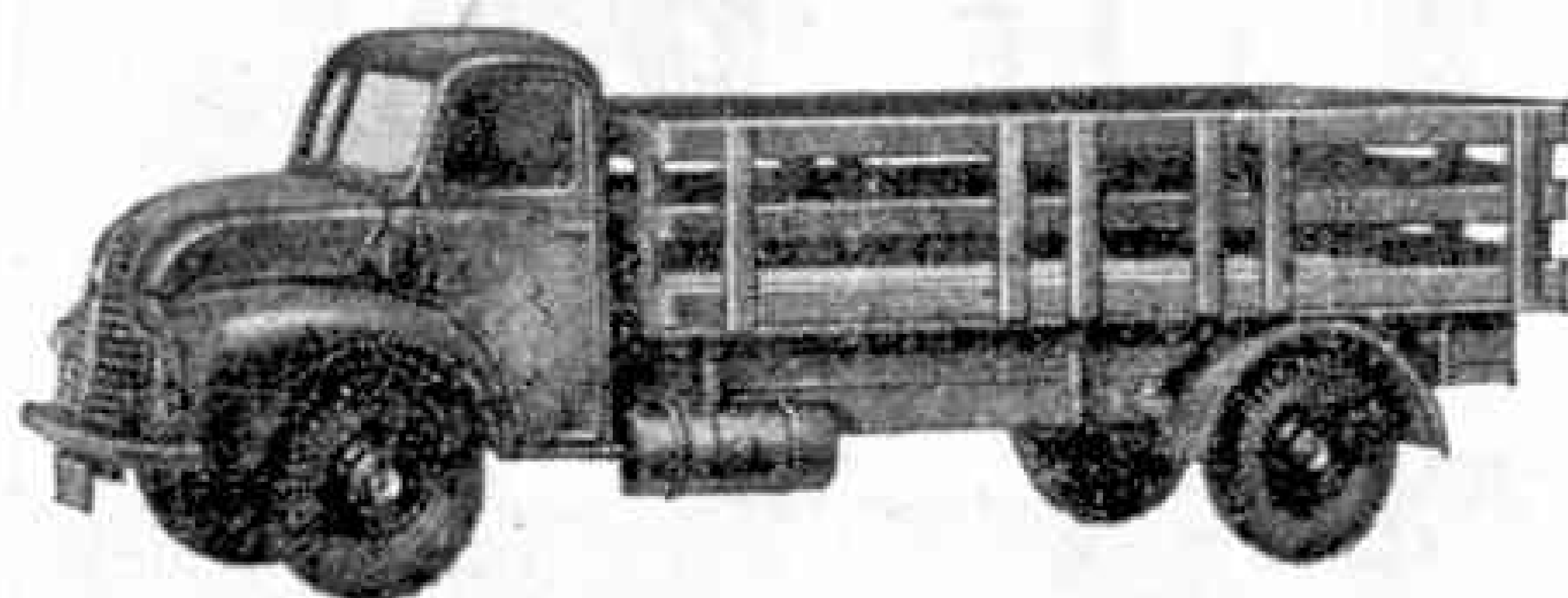
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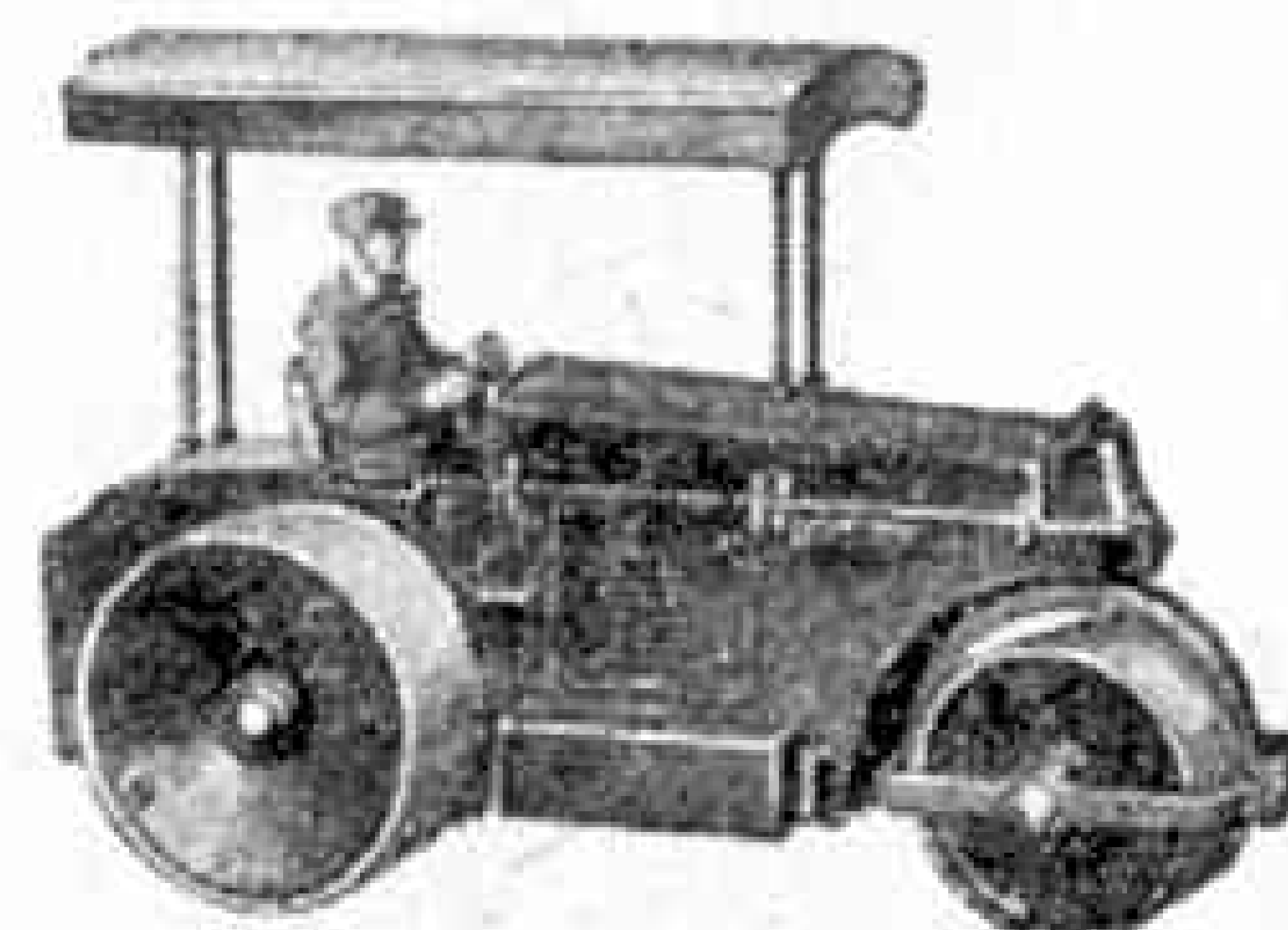
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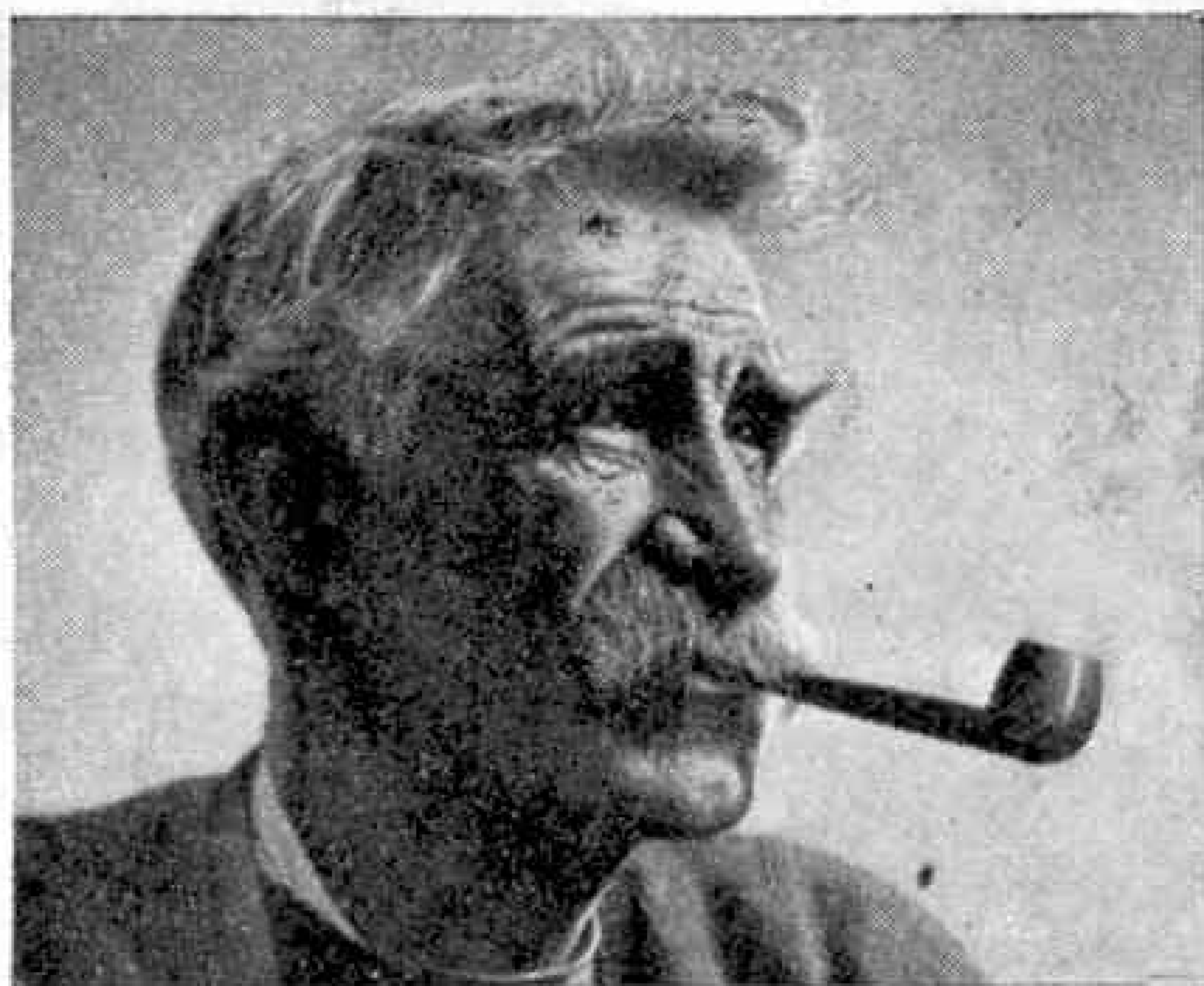
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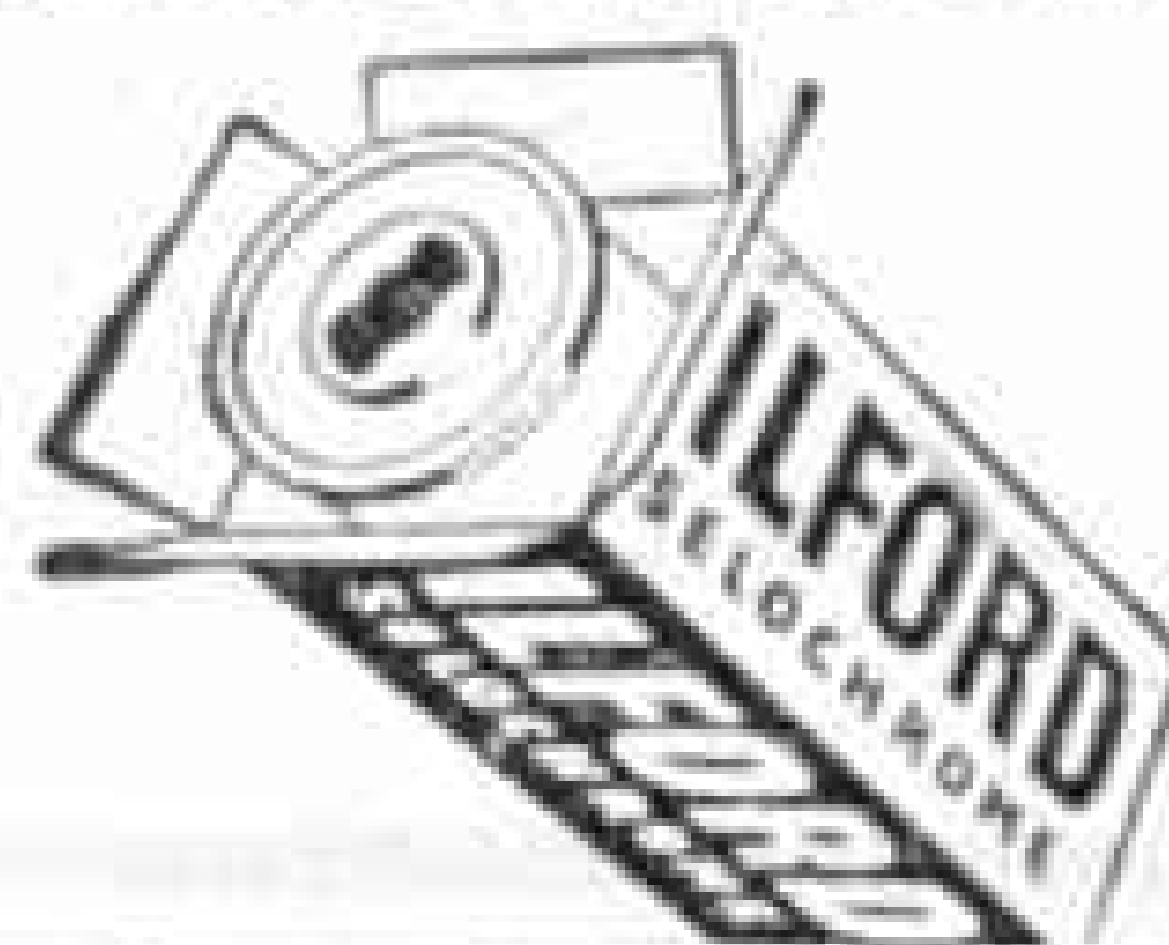
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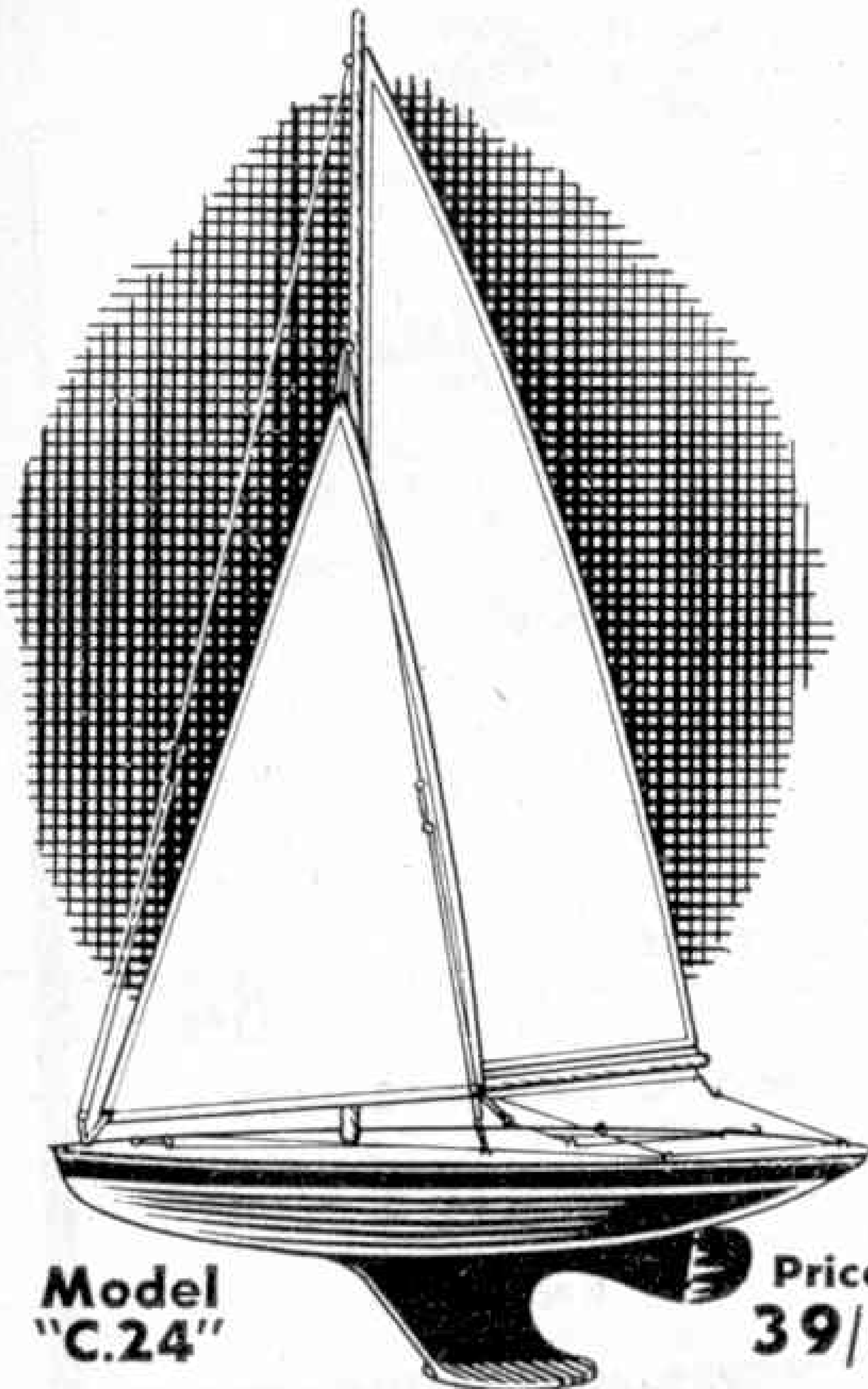


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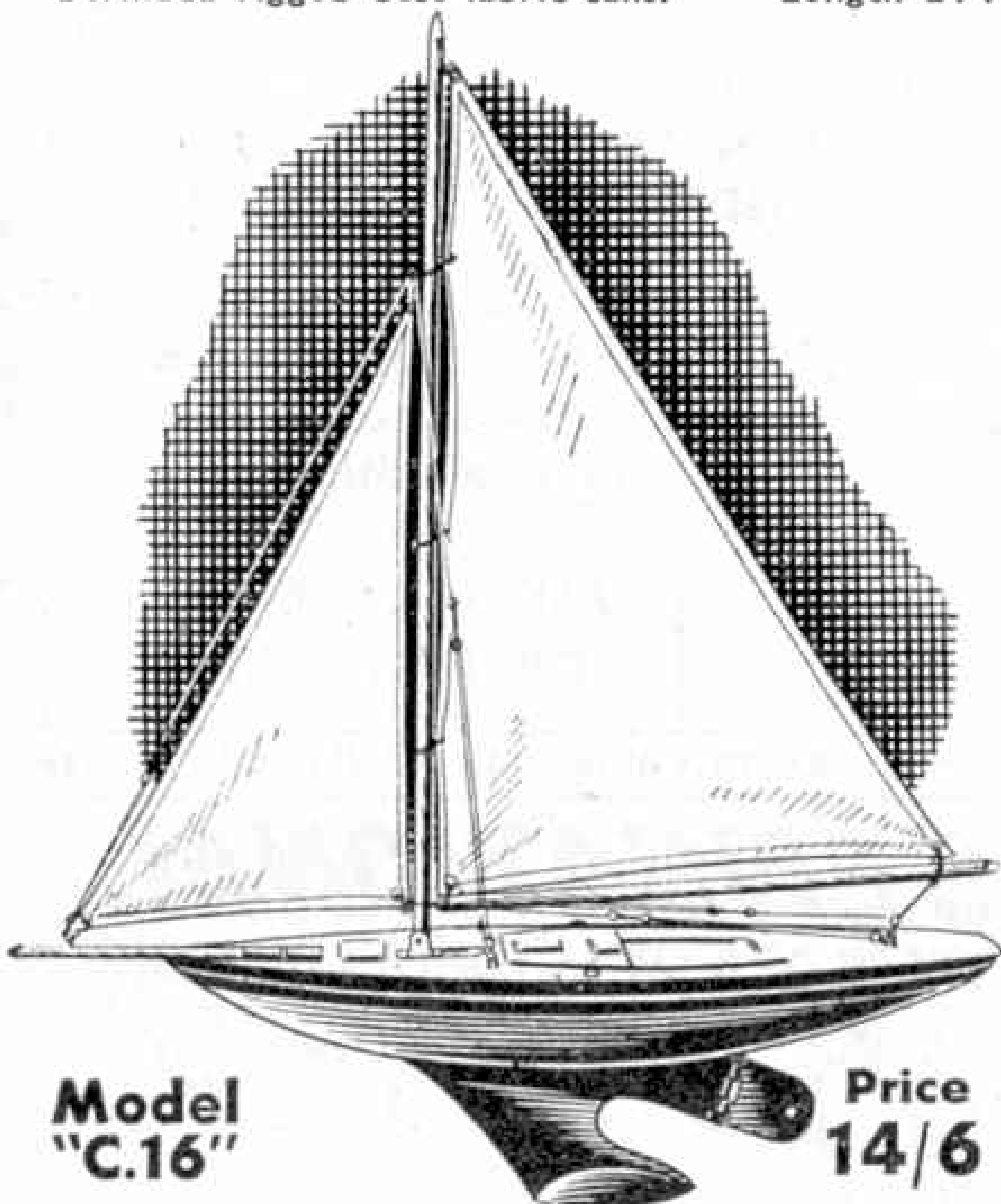
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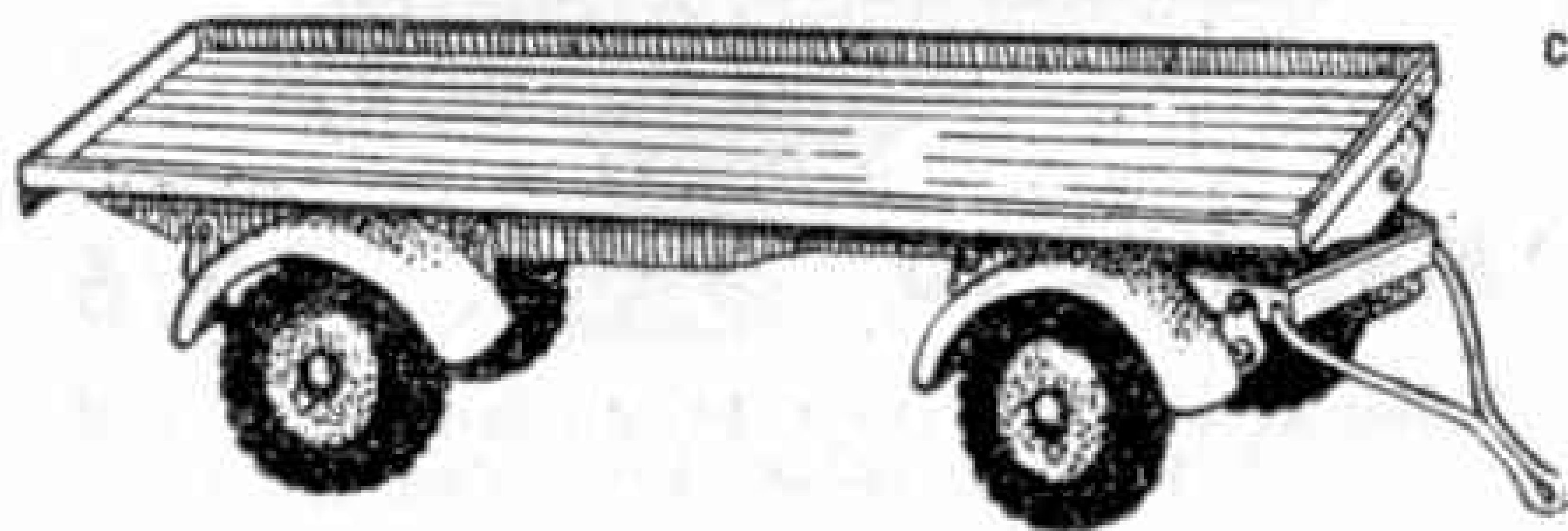
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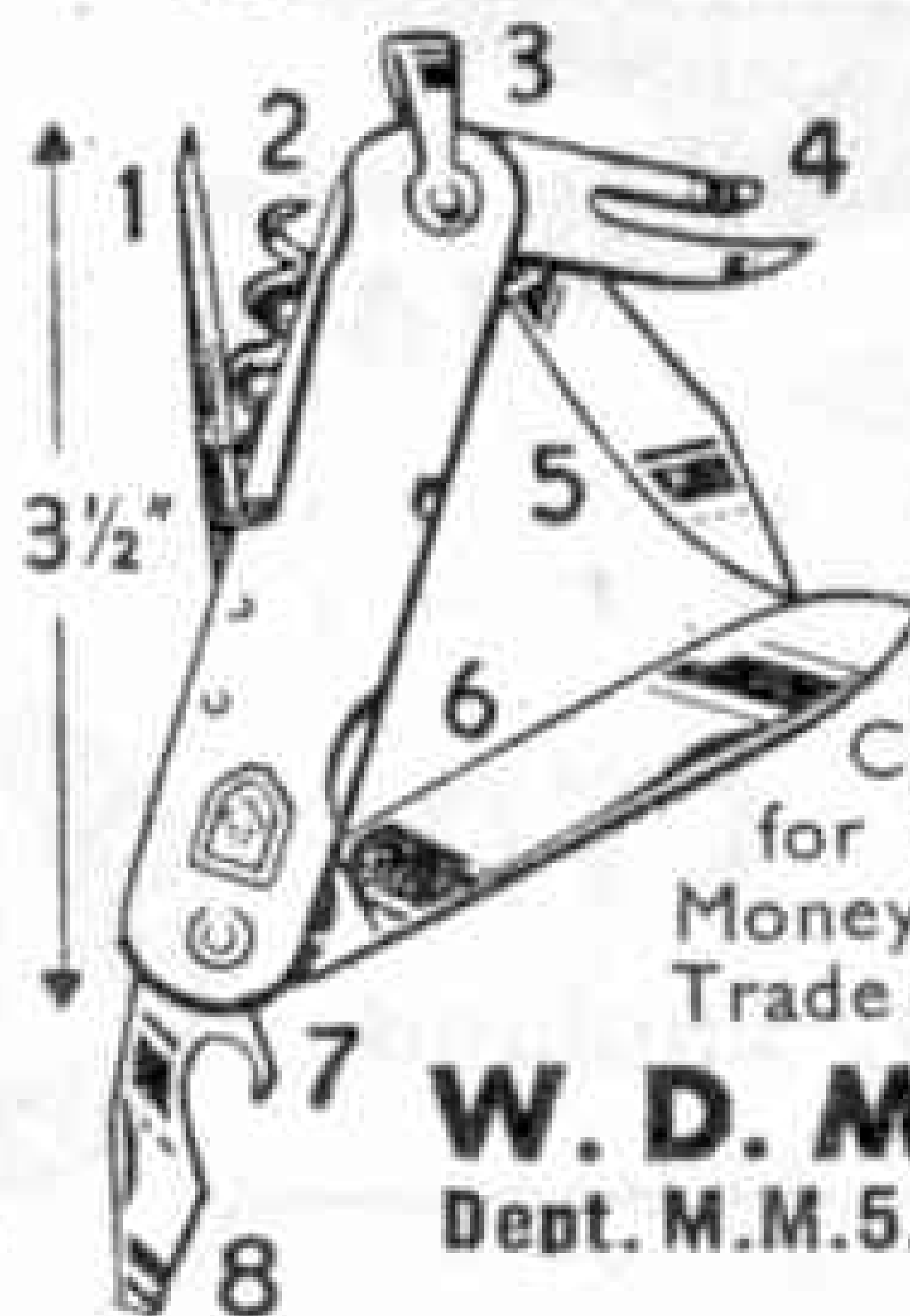


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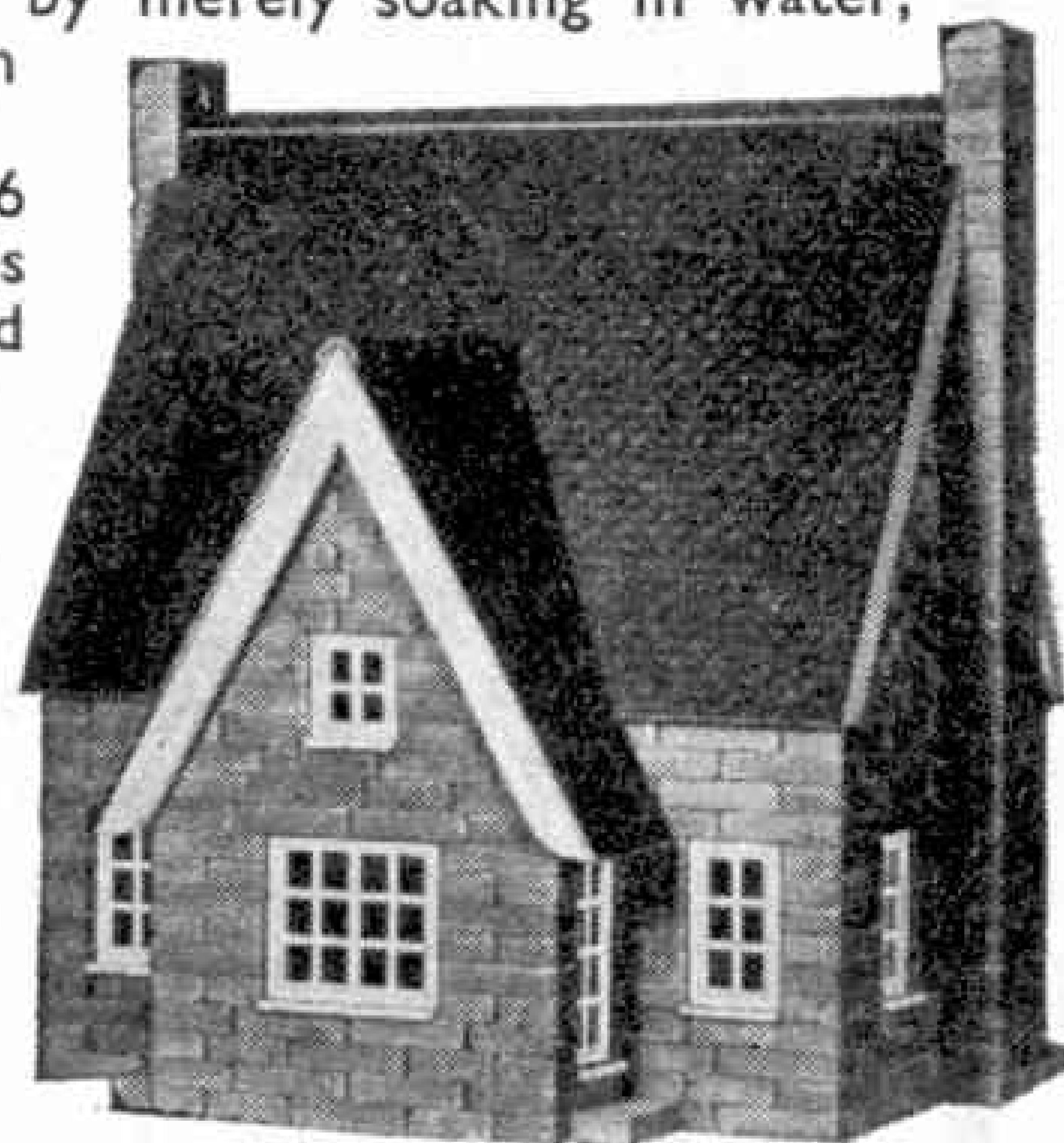
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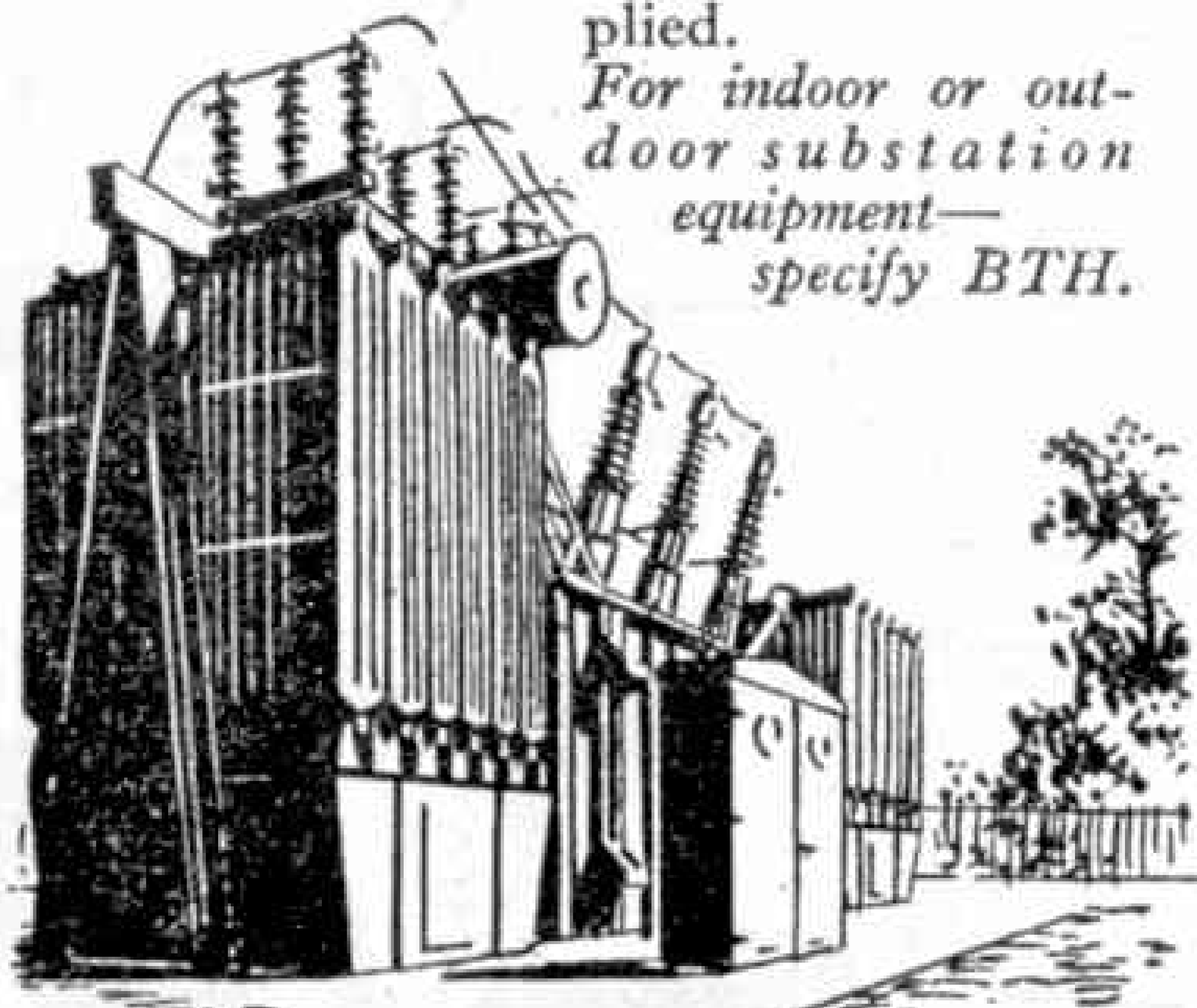
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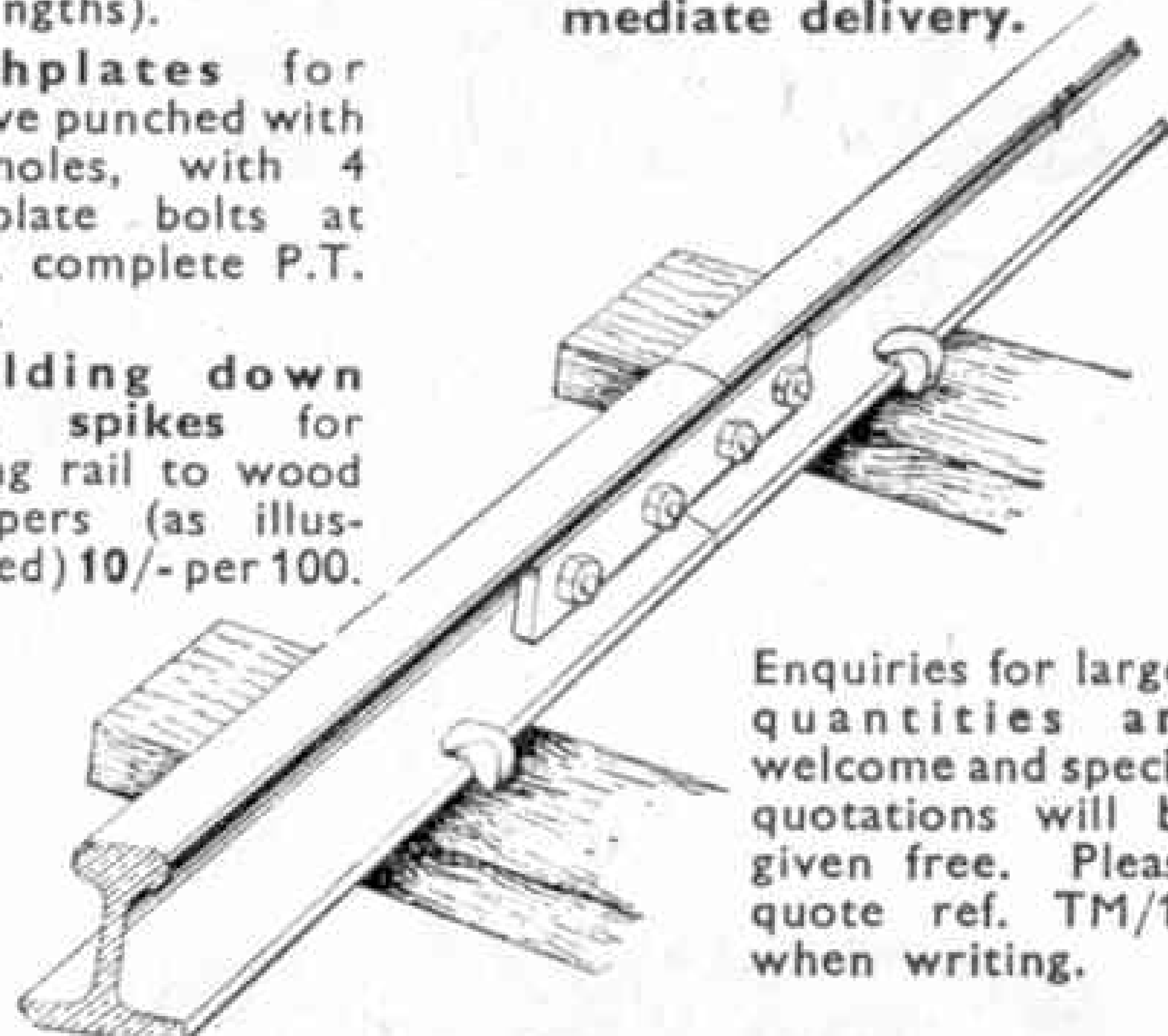
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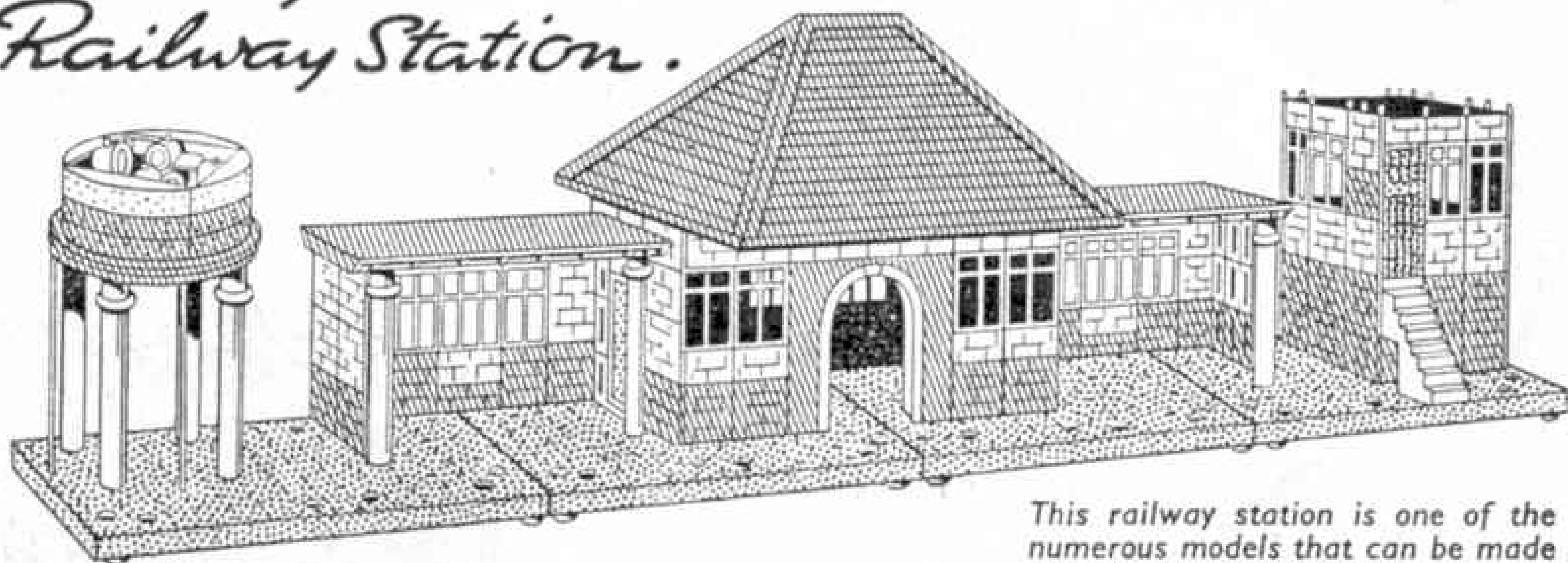
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Yes, he uses a Raleigh
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for all his road training
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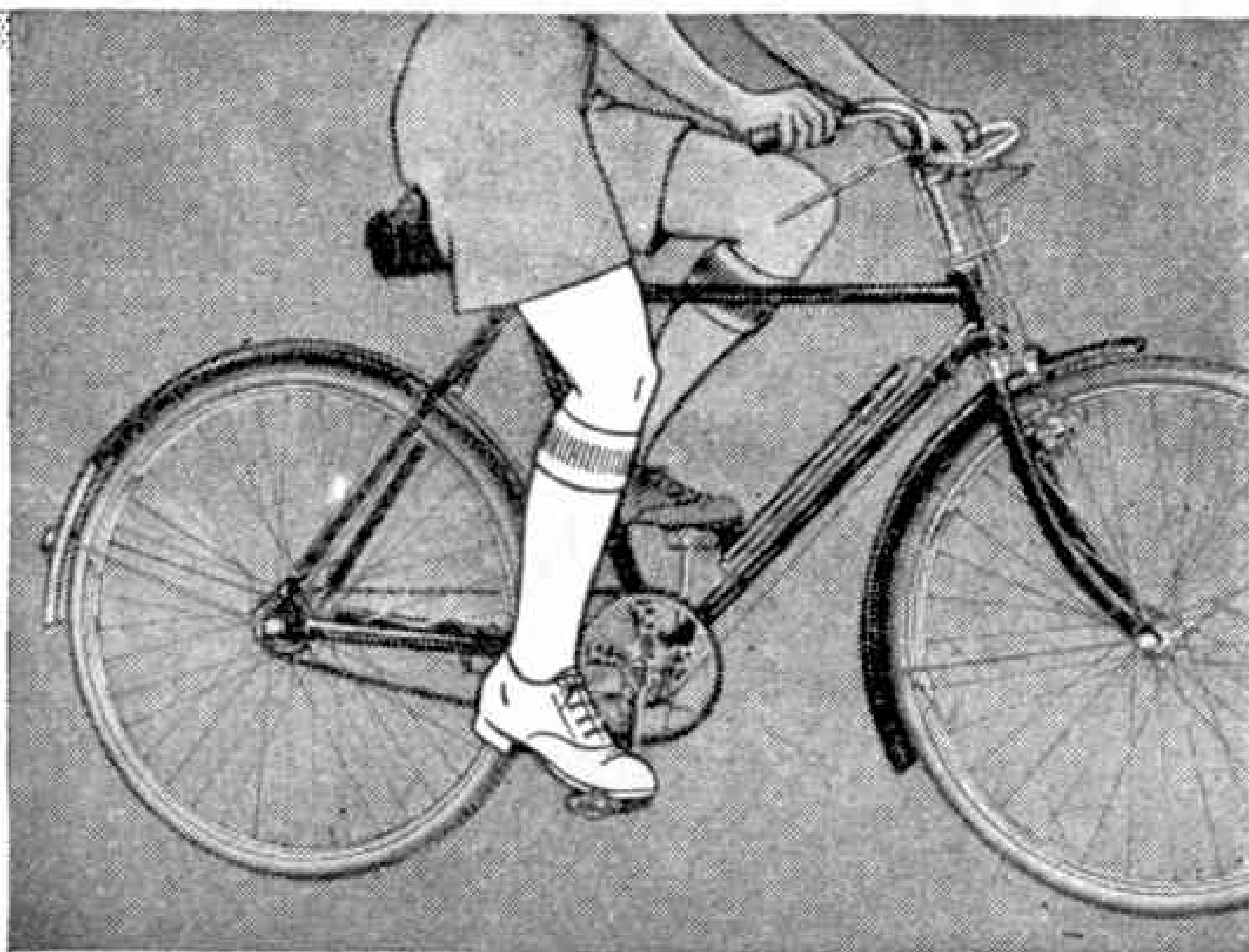
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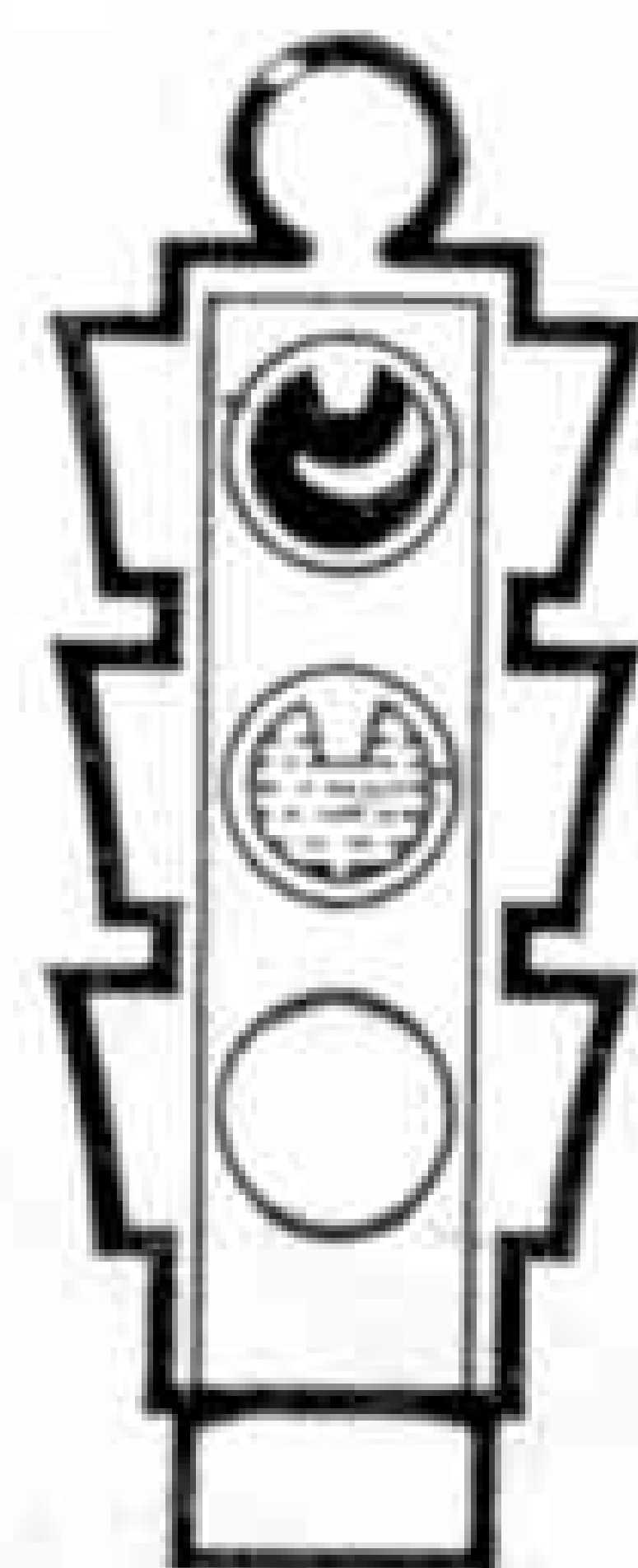
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MECCANO

MAGAZINE

Editorial Office:
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Vol. XXXVI
No. 7
July 1951

With the Editor

The Festival of Britain

A first visit to the South Bank Exhibition which forms the centre piece of the Festival of Britain leaves one with a feeling of having visited another world! This is due partly to the very great freedom that has been allowed to the display artists and designers of the various buildings, and the widespread use made of materials such as glass and aluminium in the construction of pavilions and buildings in designs that would appear fantastic outside the Exhibition ground. This is nowhere more apparent than in the Dome of Discovery, which shows how aluminium can permit the erection of a structure whose immensity cannot be appreciated until it is entered. It is a marvellous engineering and architectural achievement, but no doubt there will be many who will not like the result!

One section of this Dome of Discovery that impressed me particularly is that devoted to explaining the mysteries of Outer Space. Here, by means of ingeniously constructed animated displays, one can see the Solar system with its family of planets, carrying out their relative movements. Another display illustrates the movement of the Solar system in the vast Universe of space.

The sections devoted to the development of transport and engineering are very fascinating, especially the exhibits that can be set in motion by the visitor himself by pressing a button. I was specially interested in one that shows how, by synchronising the propellers, vibration in an aircraft can be largely eliminated.

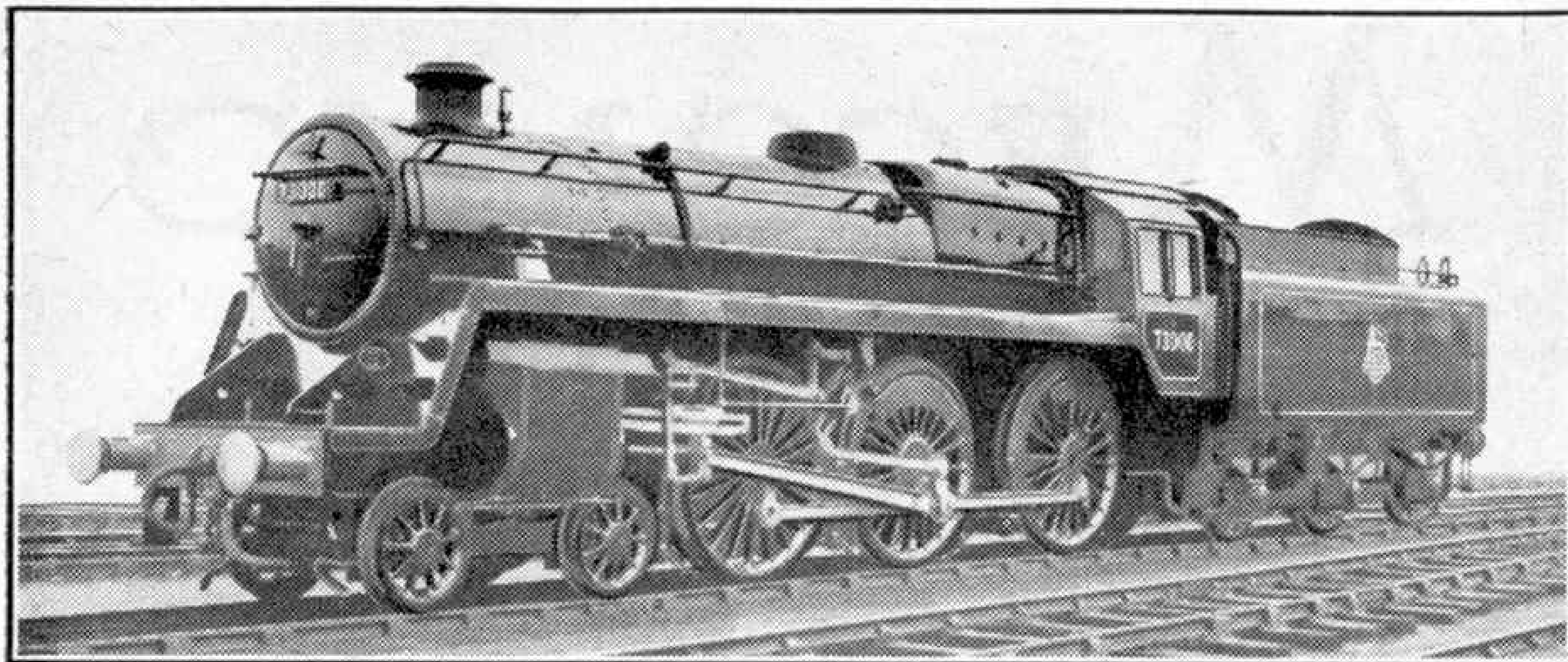
Every reader who can possibly do so should visit the South Bank Exhibition. For those who cannot I recommend the Land Travelling Exhibition which opened in Manchester and is to visit Leeds,

Birmingham and Nottingham. Prominent exhibits in this interesting show are a huge illuminated Meccano Ferris Wheel, and a working Hornby-Dublo railway. Visitors interested in aircraft will find much to attract them in the sectionalised jet engines and other exhibits showing the tremendous progress made in this form of power unit during the last few years, and the great part that British enterprise, skill and resource, has played in its development.

This Month's Contents

	Page
New B.R. Mixed Traffic Engine	290
Caversham Park	292
by Trevor Holloway	
The Air 'Bus is Coming ..	295
by John W. R. Taylor	
Exploring the Menai Strait ..	296
by E. Emrys Jones	
Giant Overhead Travelling Crane	300
Gauge 0 "Dublin and Kingstown"	
Train	303
Battery Electric Vehicle ..	306
by W. Anderson	
County Antrim's Last Narrow	
Gauge Line	310
by E. M. Patterson	
A Modern Steam Trawler ..	313
"Forewarned is Forearmed" ..	314
by John W. R. Taylor	
Novel Grab for Cranes ..	319

Air News, 304. Books to Read, 298. Club and Branch News, 324. Competitions and Results, 332-3. Fireside Fun, 335. From Our Readers, 318. H.R.C. Pages, 325-7. Model-Building Competition Results, 320. New Meccano Model, 322. Photography, 309. Shipping Notes, 302. Railway Notes, 316. Stamp Pages, 329, 331.



The New B.R. Mixed Traffic Engine

AS recorded in "*Railway Notes*" this month, engines of the second class of British Railways standard locomotive designs have now appeared, and the photograph on this page gives a very good idea of the general appearance of the first one, No. 73000. This is a 4-6-0 tender engine intended for mixed traffic duties similar to those already being performed by the "Black Staniers" of the former L.M.S., the L.N.E.R. B1s and the Western "Halls," all of these being 4-6-0s with two cylinders and with driving wheels round about 6 ft. in diameter. Of the 30 engines being built at Derby this year the first five, Nos. 73000-5, are to go to the Scottish Region, while the others, Nos. 730005-29, are for London Midland duties. The parent office of the design for this new locomotive class is Doncaster, but certain sections were designed at Brighton, Derby and Swindon respectively.

Many features and details of the new design are common with those of the first B.R. standard locomotive, the 4-6-2 "*Britannia*" described in the "*M.M.*" last April. Externally too, there is a recognisable "family likeness" between the two engines. No. 73000 has a solid,

compact look about it and is of simple straightforward two-cylinder design having a wide range of route availability throughout British Railways. The engine generally has been arranged with all working parts easily accessible.

The smoke-box is of the self-cleaning type and the fire-box is provided with a rocking grate and self-emptying ashpan. A steam manifold supplying the various

fittings and auxiliaries is located on top of the fire-box ahead of the cab. There are separate shut-off cocks to each steam supply pipe as well as a main shut-off valve, this being operated from inside the cab. The boiler follows closely the design of that of the existing London Midland Class 5 4-6-0s, the flanged plates being

common to both classes. Unlike the arrangement on "*Britannia*," the regulator valve is in the dome, but as on that locomotive it is operated by an external rod running along the fire-box side from the cab. The clack valves for the top feeds are placed well forward and the safety valves are above the fire-box.

The whistle, which is of the three-tone pattern, is mounted on the smoke-box behind the chimney. It is operated from

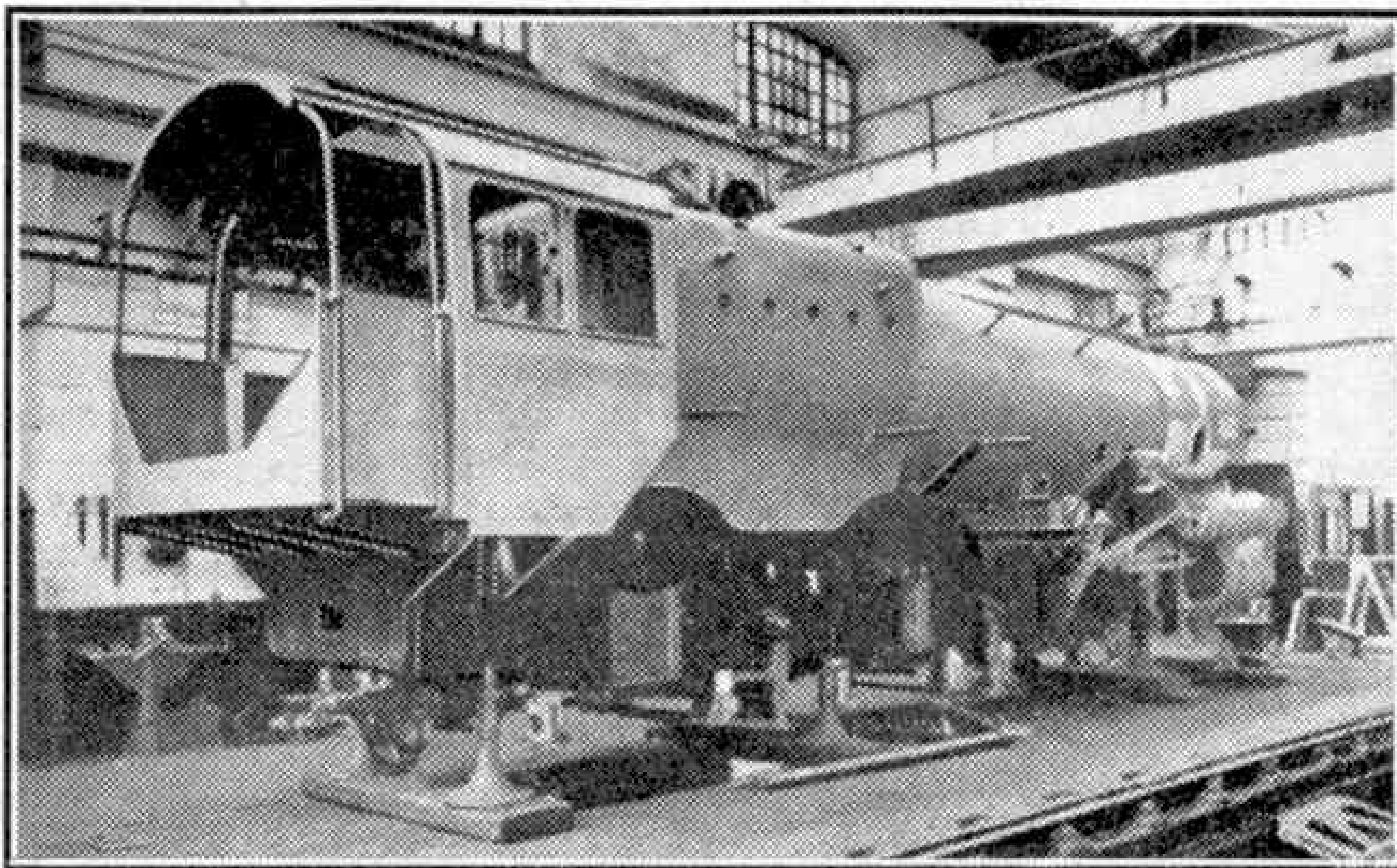
LEADING DIMENSIONS OF B.R. 4-6-0 No. 73000

Cylinders (2)	19 in. by 28 in.
Coupled Wheel diameter	6 ft. 2 in.
Heating Surface—	
Tubes	1,479 sq. ft.
Fire-box	171 sq. ft.
Superheater	369 sq. ft.
Grate area	28.65 sq. ft.
Working pressure	225 lb. per sq. in.
Tractive effort	26,120 lb.
Engine weight in working order	76 tons
Tender weight in working order	47 tons 4 cwt.
Coal capacity of tender	7 tons
Water capacity	4,250 gallons

the cab by a flexible cable passing down the handrail on the right hand side of the engine. As a result of the smoke-box diameter and pitch, the chimney is of reasonable height and is of sturdy though quite pleasing design.

The engine and tender are carried on roller bearing axle-boxes throughout, and ball bearings are provided for the big ends of the eccentric rods. The cylinders have large piston valves 11 in. in diameter and the motion is arranged to cut-off in full gear at 77.5 per cent. An underhung crosshead with the three-bar arrangement of slide bars reminiscent of Doncaster practice is provided.

The cab arrangements follow exactly the layout of the experimental dummy cab illustrated some time ago in the "M.M." All the fittings required by the driver are grouped to be of easy access from his seat. The brake, sanding and blower valves are carried on a control column at his right hand; the exhaust and live steam injectors are both carried on the right hand side under the cab; and all steam and water controls for these are operated from the fireman's side of the engine.

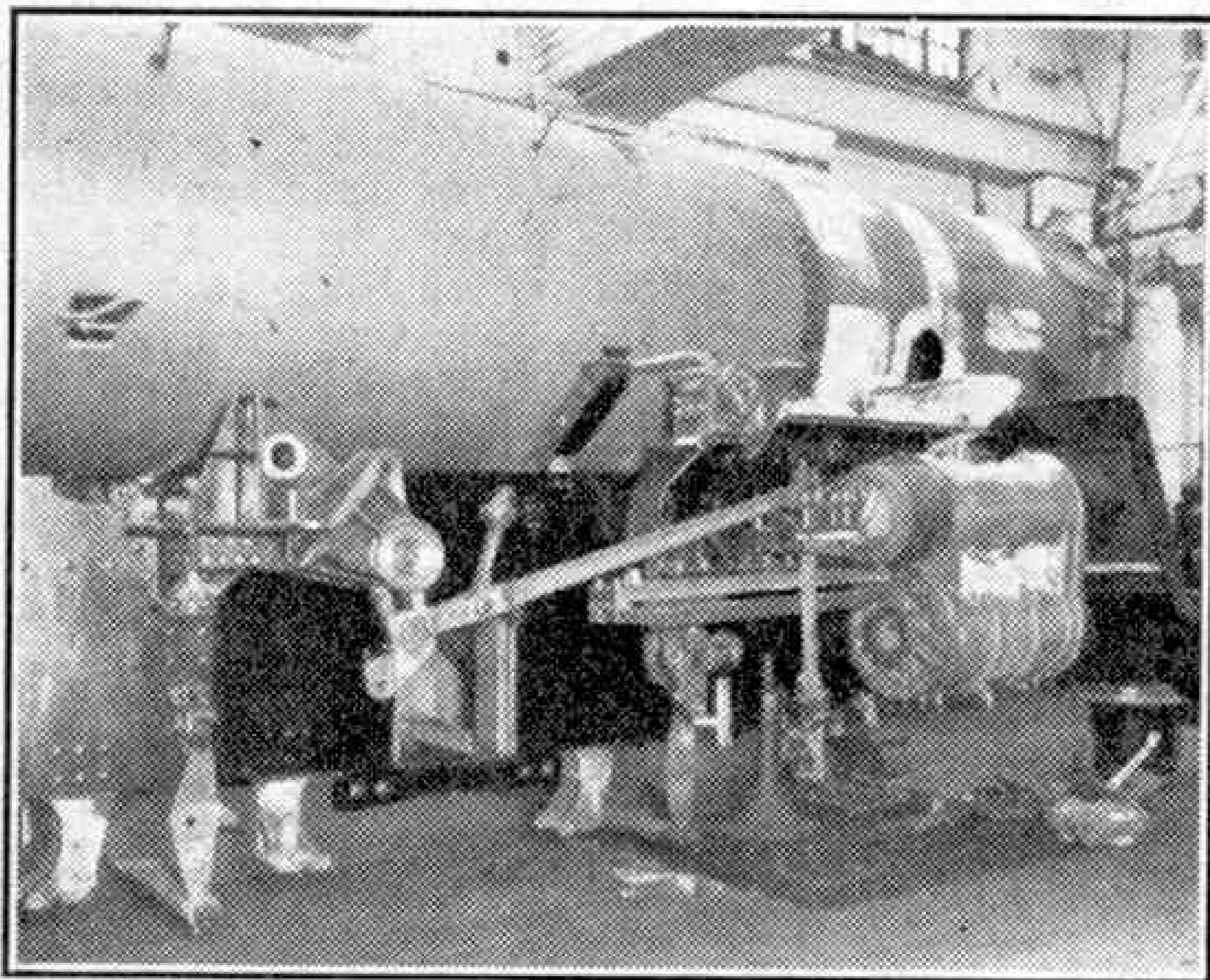


A view of No. 73000 in the erecting shop, showing the cab and details. The illustrations to this article are from British Railways Official Photographs.

As on "*Britannia*," the engine footplate is extended back to the tender front, thus providing a level floor for the crew to work on and eliminating the usual hinged drop plate. With the spectacle plate of the cab set at an angle there is a good range of vision ahead. The upper part of each cab side slopes inward slightly and outside it is a small glass screen of the type common nowadays for the benefit of the driver and fireman when leaning out of their respective side windows.

The tender is of the same pattern as that provided for "*Britannia*," having a set-in bunker. The front plate is extended outward from the bunker to form a sort of weather board with spectacle glasses for running in reverse. There is a built in tool tunnel to accommodate the long fire irons and there are lockers and cupboards for the use of the footplate men. Water pick-up apparatus is fitted and access to the tank top is given by means of a ladder at the rear end. The steam brake on the engine and tender can be operated independently or in conjunction with the train vacuum brake by a separate driver's valve.

Engine and tender are finished in the standard mixed traffic style of glossy black, with red lined boiler barrel and cylinder lagging bands. The tender and cab side panels are lined out in grey, cream and red, and the tender has the now familiar lion and wheel emblem of British Railways.



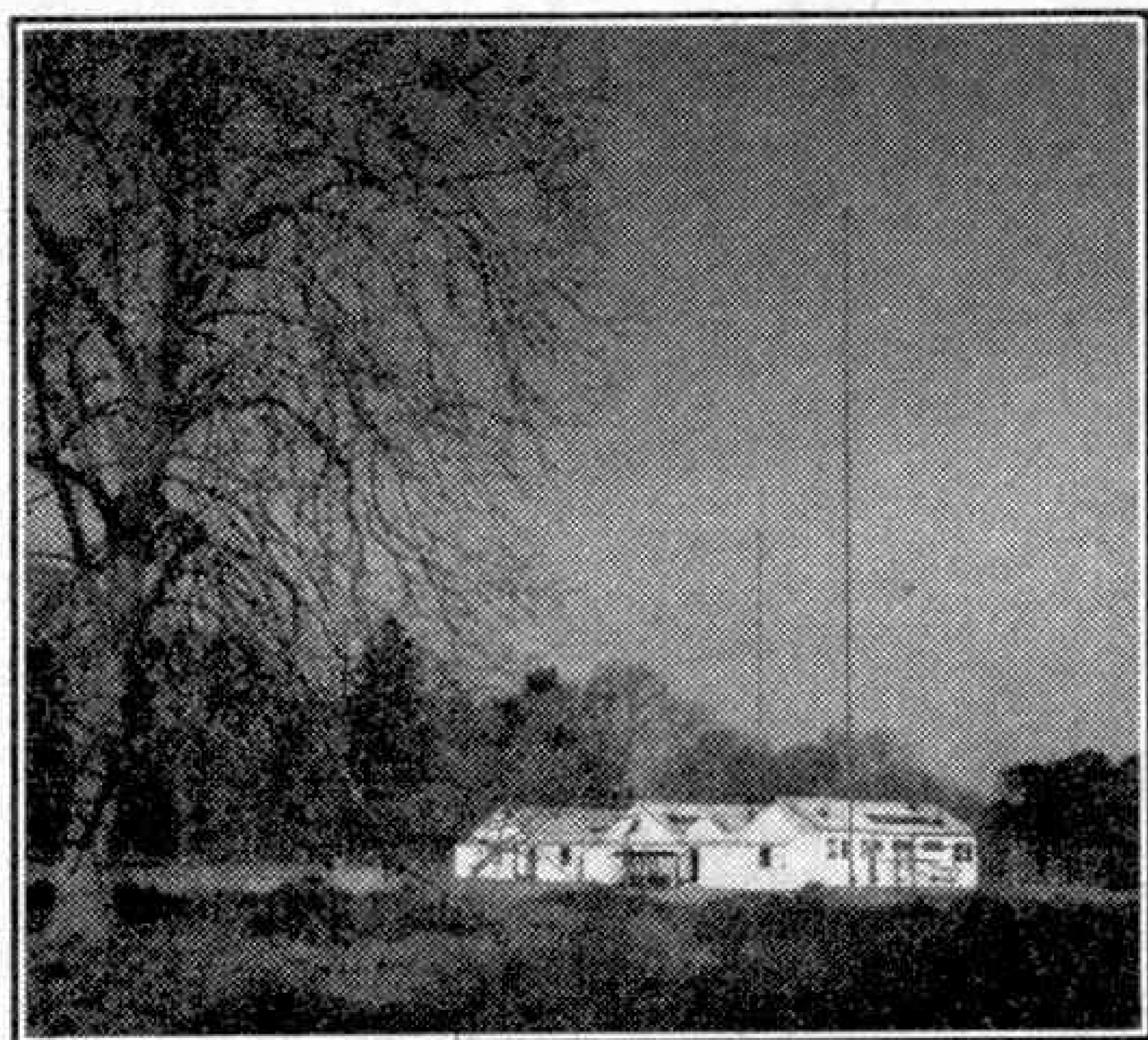
A close-up view of the engine before being wheeled. The valve motion is partially erected.

Caversham Park

The World's Greatest Listening Station

By T. Holloway

IT is a curious fact that although scores of articles are written every year describing the various departments of the B.B.C., seldom do we see an account of the Monitoring Service. This has its headquarters at Caversham Park, near Reading, which has the distinction of being the world's most efficient listening post.



The remote reception centre of the B.B.C. at Crowsley Park, near Caversham Park, where broadcasts from radio stations at the uttermost ends of the Earth are brought in with the aid of special aerials. The illustrations to this article are reproduced by courtesy of the B.B.C.

You might look through a dozen dictionaries without finding a hint of what is meant by monitoring, as interpreted at Caversham. From the B.B.C. viewpoint this means listening, translating, recording and passing on what the world's wireless waves are saying. Caversham, in conjunction with its sub-reception station at Crowsley Park, situated a few miles away, does indeed "bring in" broadcasts from radio stations at the uttermost ends of the Earth. Not only does it pick up the feeblest of feeble radio waves, but what is more remarkable, it brings them to the monitors' headphones in strength and quality. Actually, the marvellous aerial arrangements of Caversham and Crowsley have no equal elsewhere in the world for

long-distance high-quality reception.

Exactly what role does Caversham play in the B.B.C. set-up? The need for a world-wide listening centre was obvious from the moment the Corporation began to send out broadcasts in foreign languages. Those responsible for compiling the programmes for foreign countries wanted to know what the people were being told by their own and other sources of news, and listeners' likes and dislikes. In the light of such knowledge, the programme compilers could more readily plan the most useful transmissions.

Side by side with this method of programme analysis there has grown up, willy-nilly, another and perhaps even more important service. Caversham is now a major source of foreign news to the compilers of the B.B.C. Home, European and Overseas news broadcasts, as well as to Government departments, Embassies and the Press.

From the terrace in front of the imposing building at Caversham Park the visitor may catch a glimpse of some of the 40 or more aerials that feed the scores of super-receiving sets manned by the monitors in the main listening room. These aerials are of the omni-directional type, that is they are designed to pick up signals equally well from all directions. The aerials are suspended from 100 ft. tubular-steel masts standing in a flat field some 10 acres in extent, and are set at the greatest possible distance from the house itself to minimise the risk of electrical interference.

In order to convey these relatively interference-free signals to the monitors' receivers, B.B.C. engineers have evolved what they term the amplified aerial system. By this method the signals are boosted close to the actual aerial wires and conducted by way of underground interference-free screened cable to the distributing network in the main building. The engineers are justifiably proud of their handiwork, for there is no other system in the world like it, or of

superior efficiency. With a small number of aerals a large number of different signals can be picked up simultaneously under electrically "quiet" conditions and fed without loss of strength or quality to the receivers.

Now although the aerial system is so highly efficient at Caversham, there are some signals which even its criss-cross of lofty aerals cannot detect. In such cases, the sub-reception station at Crowsley comes to the rescue. There, in a deer park of 250 acres, are miles of aerals specially designed to capture weak and "chancy" signals, which in ordinary conditions would never be heard above what we usually term "background noise."

Crowsley's aerals, unlike Caversham's, are uni-directional and of two types, the Beverage and the Rhombics. The Beverage aerals, which are mostly used for picking up long and medium-wave signals, consist of a wire running out in the direction of the source of the wanted signal. The lengths of the various aerals vary from 900 ft. to 3,000 ft., and each is suspended on 10 ft. poles spaced at intervals of about 20 yds. Crowsley has 12 of these Beverage aerals, one for each 20 deg. covering

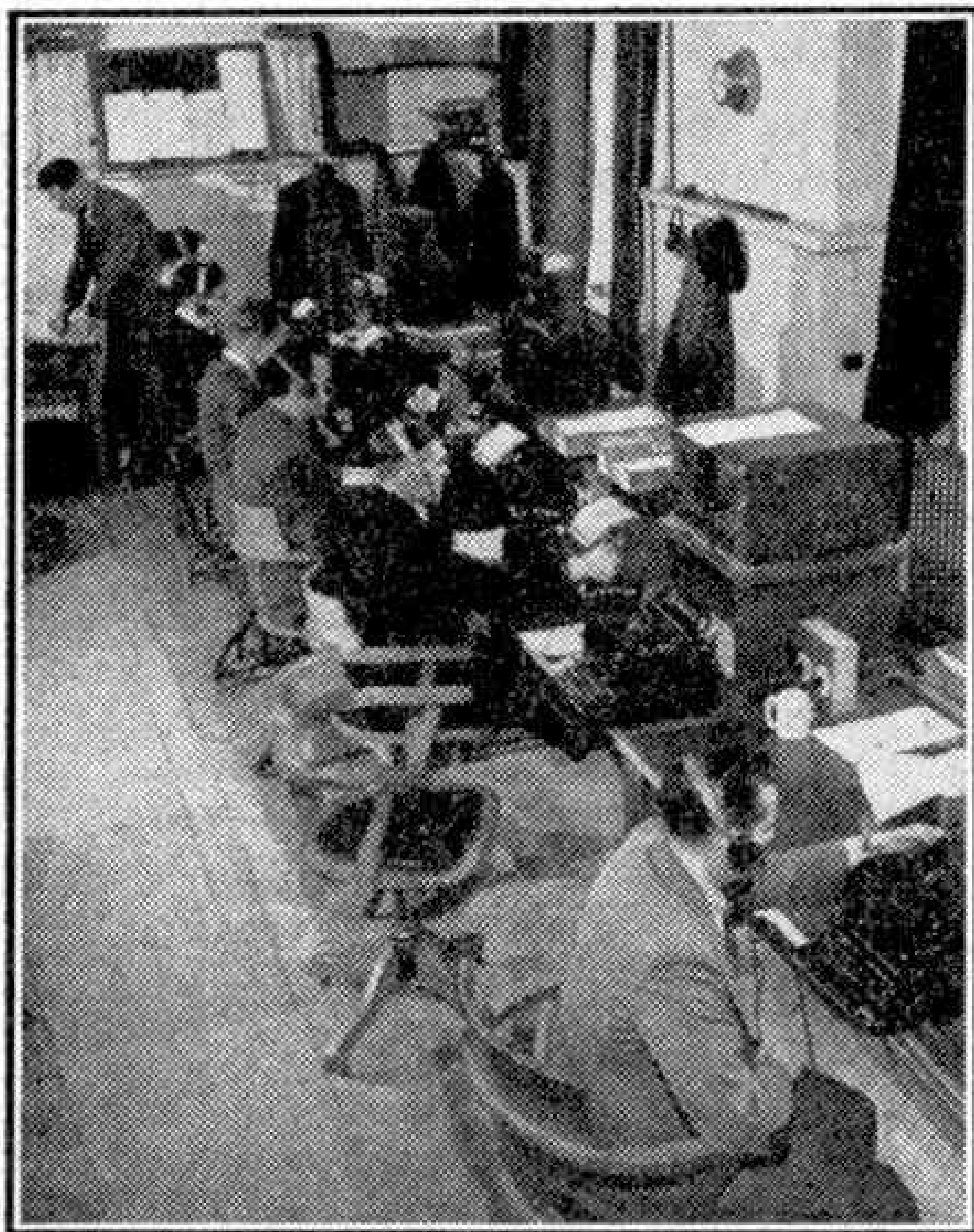


A section of the main listening room at Caversham Park, where experts listen to the world's radio and record items of special interest.

Europe, Asia, the Far East, Australia, the Middle East, North Africa, and South America. For example, the -40 deg. Beverage is "beamed" as it were on Scandinavia, North Siberia, Japan and the Far East. The Rhombics aerals, five in number, are specially designed for picking up short wave signals.

The wires from all the Crowsley aerals converge on a central gantry and from there are led into the specially designed interception room. The staff at this sub-reception station are essentially engineers, not monitors as at Caversham Park. Inside the building the visitor can see, or rather hear, what miracles of reception can be achieved when all outside interference is suppressed. All main supplies go underground a mile away, and suppressors are fitted to cars attached to the station so that they shall not be the sources of electrical interference.

About 30 super-sensitive receivers of the communications type are used to detect the signals that are too weak for Caversham to bring in, and each set can be switched to any aerial in a matter of seconds. The operators work to a carefully prepared schedule specifying what stations must be tuned in. For instance, a recent schedule for a shift included Damascus, Delhi, Moscow, Bucharest, Belgrade, Prague, Budapest, Vienna, Rome, Helsinki, and Sofia. Not long ago the engineer in charge of shifts demonstrated to a visitor a sample of Crowsley's efficiency by tuning in quick succession Australia, Damascus,



Morse code is largely used to carry news and information and here skilled operators type messages of this kind received at Caversham Park.

Rome, Vienna, and Moscow with perfect clarity in daylight conditions.

Although Crowsley normally works to a schedule, a senior engineer acts as liaison officer and the monitors at Caversham can ask for any particular station they are unable to pick up for themselves. On an average 12 different signals are handled simultaneously the clock round, but at peak periods as many as 22 stations have to be dealt with.

So far we have had a brief insight into the provisions made to ensure that the monitors at Caversham shall have the best possible reception on their receivers. Now let's get back to the Main Listening Room and see what use is made of the signals once they are received.

In the bright and spacious room are men and women of many nationalities, several of them conversant with two or more languages, each seated at one or other of the 40 or more receiving points. These men and women are all highly expert monitors, whose duty it is to listen to the world's radio and sift it for news of importance or any item of interest. If a monitor wishes to record anything he or she hears, the mere act of turning a switch results in a recording being made on a wax cylinder. The cylinder can then be taken to a special room and transcribed at leisure. Any doubtful passages in the recording can thus be "played back" as slowly and as often as necessary, and translated accurately.

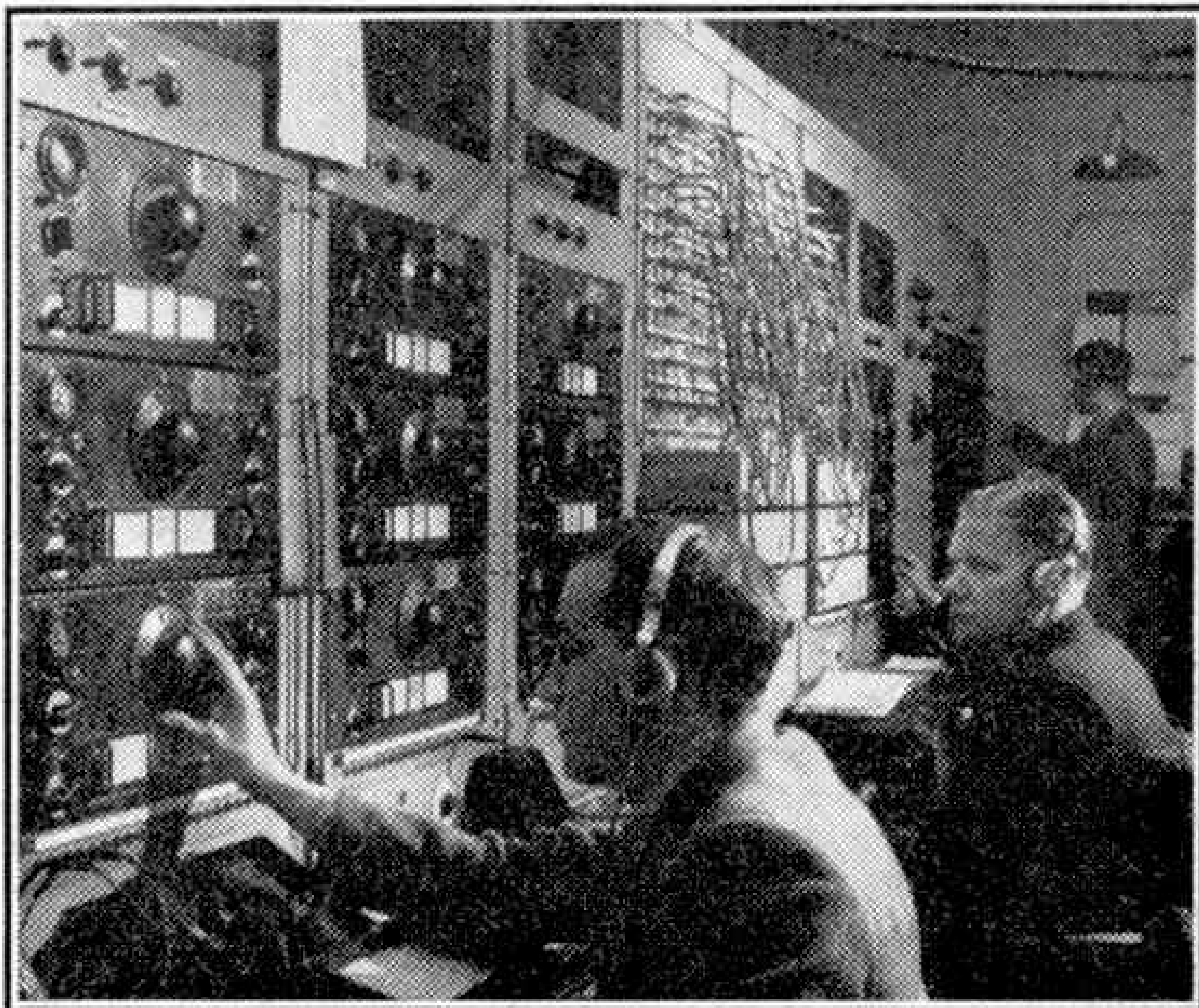
The monitoring team as a whole handle some 400 foreign news broadcasts in 30 different languages every 24 hours.

Some of the monitors, most of them retired naval men, are highly expert transcribers of Morse code signals. Morse code is often used to carry news-agency copy. Tito, for example, uses Transjug in Yugoslavia for sending out Morse signals, and the code is also used by the New China and Arab News Agencies.

Foreign broadcast news is also received over the Hellschreiber system, a pre-war German invention whereby a stream of paper gives facsimile messages that only need translating. Typed copies of all news items received are passed to the News Bureau and the Editorial Department. The News Bureau's task is to keep the

B.B.C. news departments supplied with a steady and unending stream of foreign and Commonwealth news. On an average the Bureau supplies 20,000 to 25,000 words a day, but this may rise to 40,000 words at peak periods.

Each monitor is allotted a daily programme to work to, and although responsible for his own initial sifting of news he may keep a Copy-Taster supplied with "snaps" if a big news story seems



Engineers tuning in to the more difficult stations at the remote reception centre at Crowsley Park.

likely to break. Important news flashes are given priority in translation and transcription, and the Copy-Taster instructs his sub-editors as to how the story shall be handled. No matter in what part of the world some momentous happening takes place or seems imminent, Caversham can gear its news-gathering machinery to tap all sources of radio information in a matter of seconds.

One of the chief functions of the Editorial Department is to prepare a daily summary of world news for the use of the B.B.C. and Government departments. This Monitoring Report, as it is called, is published five days a week, and is a masterly summary in about 6,000 words of all the hundreds of thousands of words selected and translated by the monitors in the course of the preceding 24 hours.

Day and night, year in and year out, the aerials at Caversham and Crowsley stand silent and aloof, listening to the radio voices of the world, rescuing from the ether the faintest whispers from the uttermost parts of the Earth.

The Air 'Bus is Coming

Commercial Helicopters

By John W. R. Taylor

THE picture on this page looks very like those imaginative drawings we used to see in "science fiction" papers a few years ago, illustrating a city of the future, with helicopter air 'buses linking towns as regularly and cheaply as their roadborne counterparts of to-day. Yet it will not be very long before the first British air 'buses are flying, and rotor-stations are already being built or planned in many towns.

A hint of things to come was given

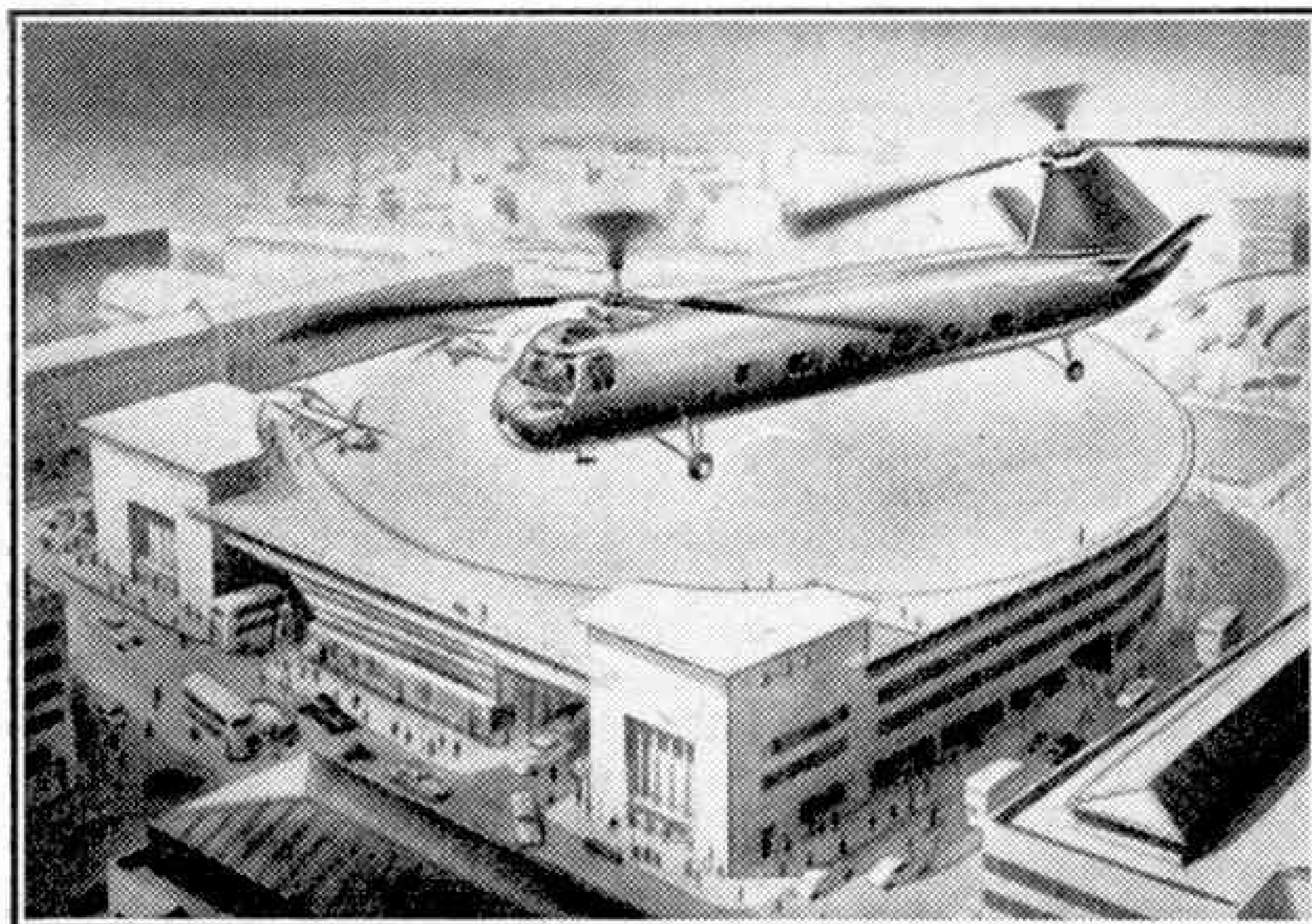
big step forward, as its two 550 h.p. Alvis "Leonides" engines are so arranged that either of them can turn both rotors in an emergency. It thus offers a high standard of safety, making possible operation from city centres instead of between airfields as at present.

The Bristol 173 has been designed primarily to carry 13 passengers and their luggage at 105 m.p.h. over short or medium ranges, but it can be converted easily into a freighter with a 2,500 lb. payload.

All being well, it should be ready for airline service by about 1954, and there is little doubt that it will revolutionise travel between cities and in remote areas like the Western Isles of Scotland.

Even more revolutionary will be the Fairey "Rotodyne," the existence of which was revealed for the first time in this Report, and which will bring all the safety and speed benefits of jet propulsion to the commercial helicopter. It has, in fact, been designed to carry 23 passengers at a cruising speed of 135 m.p.h., which is faster than the present International Helicopter Speed Record.

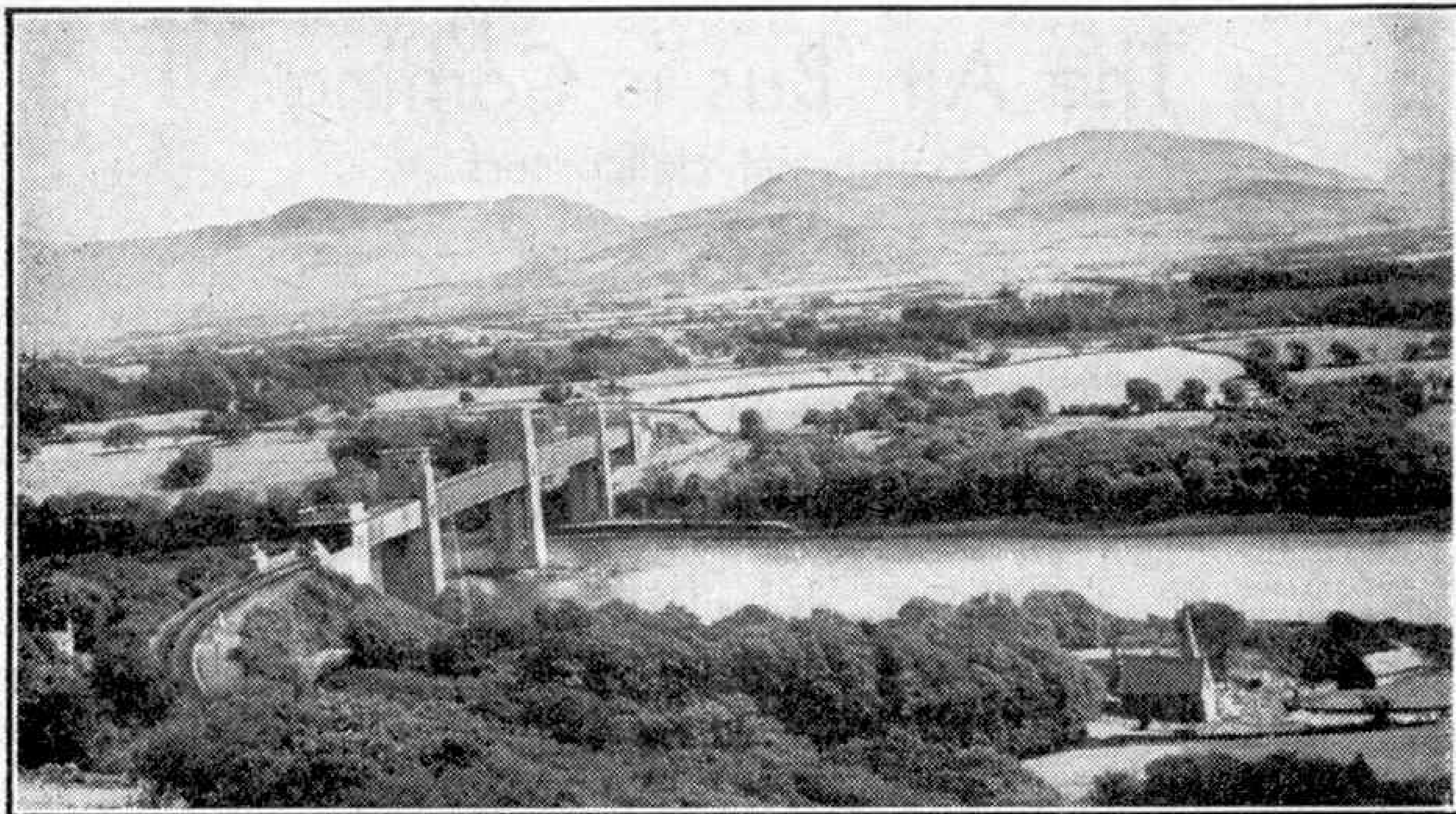
According to the Report, the "Rotodyne" will have two propjet engines mounted on stub wings outboard of its fuselage. Air will be tapped from these engines and ejected from the tips of the rotor blades to turn them; and the blade tips will also be fitted with separate small jet units to provide extra power for take-off and landing. But perhaps the most welcome statement in the whole Report is that, whereas smaller helicopters offer great saving in time and convenience to the air traveller at comparatively high cost, the "Rotodyne" should be the first helicopter able to show a profit on air 'bus services. Its coming will therefore be awaited eagerly by both the airlines and their customers.



An artist's impression of the Bristol 173, Britain's first twin-engined helicopter, which is due to fly this Summer. Photograph by courtesy of The Bristol Aeroplane Co. Ltd.

in an official report published a few weeks ago under the formidable title of "*First Report of the Interdepartmental Helicopter Committee.*" It is a most interesting document, as it reviews progress already made by British helicopter manufacturers and by B.E.A.'s Helicopter Unit, and then goes on to show how these will lead in time to a network of helicopter routes replacing and supplementing B.E.A.'s present internal air liner services. As a start, London and Birmingham are being linked by three-passenger Westland Sikorsky S.51s, which will be replaced after a time by Bristol 171 "Sycamore" four-seaters and then by Bristol 173s, as shown in the drawing on this page.

Introduction of the Type 173 will be a



Exploring the Menai Strait

By E. Emrys Jones

SEPARATING Anglesey from Caernarvonshire is one of the most interesting and beautiful stretches of water in Britain. The Menai Strait is really a channel, 14 miles long and varying in width from 200 yards to three quarters of a mile. It is crossed by ferries at three points and spanned by two famous bridges, the Menai Suspension Bridge and the Britannia Tubular Bridge. The training ship H.M.S. "*Conway*" is moored in midstream. A statue of Nelson is found on the very shores, guarding the Strait from the Anglesey side. On this side are the towns of Menai Bridge and Beaumaris, and on the Caernarvonshire side there are the city of Bangor, Port Dinorwic, and Caernarvon itself.

The Menai Strait has been likened to the Rhine in Germany—and it certainly matches the Rhine in beauty. On one side is the green fertile undulating plain of Anglesey, with its yellow sands, whitewashed farms and cottages, and cultivated fields. On the other is the unique county of Caernarvon, where the land slowly rises from the very shores of the Menai, and, after passing through farmland and meadow

comes to the mighty range of Snowdonia, or Eryri as we call it in Welsh, the ancestral home of the eagle.

The Snowdonian range is 40 miles long, and runs the entire length of the Caernarvonshire side of the Strait. I need hardly mention that this mountain range is a magnificent sight, especially if viewed from a boat anchored in the Strait or from the Anglesey side. Snowdon is

the centrepiece, standing proudly with its mighty neighbours the Glyder mountains and the Carneddi range. The others take their places side by side with the friendly giants.

On the top of a 300 ft. knoll is the Anglesey column, or the Marquis Tower as it is called. It is 90 ft. high and is two

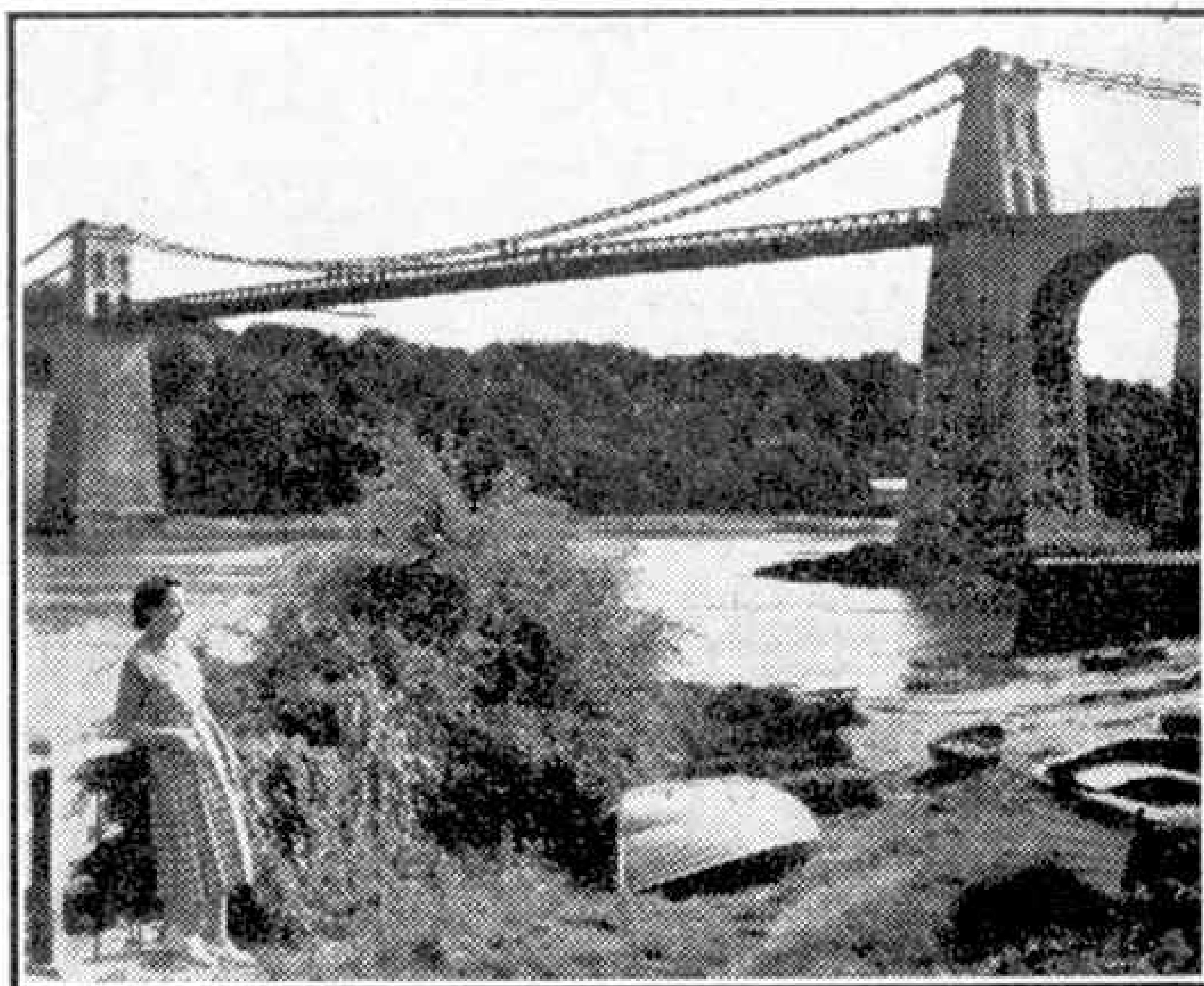
miles from Menai Bridge village on the main Menai Bridge—Holyhead road. No one should fail to ascend this tower, because of the magnificent view from it of the whole Snowdonian Range, the two fine bridges, and the Menai Strait proper. In itself it really is well worth visiting. It was erected in 1816 in honour of the first Marquis of Anglesey, who commanded the cavalry at Waterloo, where he lost a leg.

The illustration at the head of this page shows the Britannia Tubular Bridge, which carries the London - Holyhead route across the Menai Strait, with Snowdonia in the background. On the right, on the Anglesey side of the Strait, is the church of Llanfair, the full name of which has 60 letters in it.

And now to the Menai Suspension Bridge. This is one of the longest suspension bridges in Britain, measuring 579 ft. between the piers and 1,710 ft. over all. To allow for the transit of vessels, the roadway, supported by 16 chains, is raised 100 ft. above the high water mark. Telford was responsible for this graceful structure, started in 1819 and completed in 1826, at a cost of £120,000. It is still the main artery for road traffic going from London to Holyhead, the main Welsh packet station for Ireland.

The main line to Holyhead—the route of the "Irish Mail"—is carried over the Strait by the Britannia Tubular Bridge. This is Robert Stephenson's masterpiece, constructed in 1846-1850 at a cost of £600,000. It consists of two parallel rectangular tubes of wrought iron plates, supported by five towers, one of which, the Britannia Tower, is 230 ft. high and rests on a rock in mid-channel. The length of the tubes is 1,500 ft., their weight is over 10,000 tons, and they are 100 ft. above high water level. The allowance for the expansion of the Britannia Bridge on cast iron rollers, and the cellular structure of the top and bottom of each tube, are of great technical interest.

Just west of the Britannia Bridge, near the church of Llanfair, is a statue of Lord Nelson. This was designed by Admiral Lord Paget, a younger son of the first Marquis of Anglesey, and it gives one the



Telford's graceful bridge, 1,710 ft. in overall length, across which road traffic to and from the island of Anglesey passes.

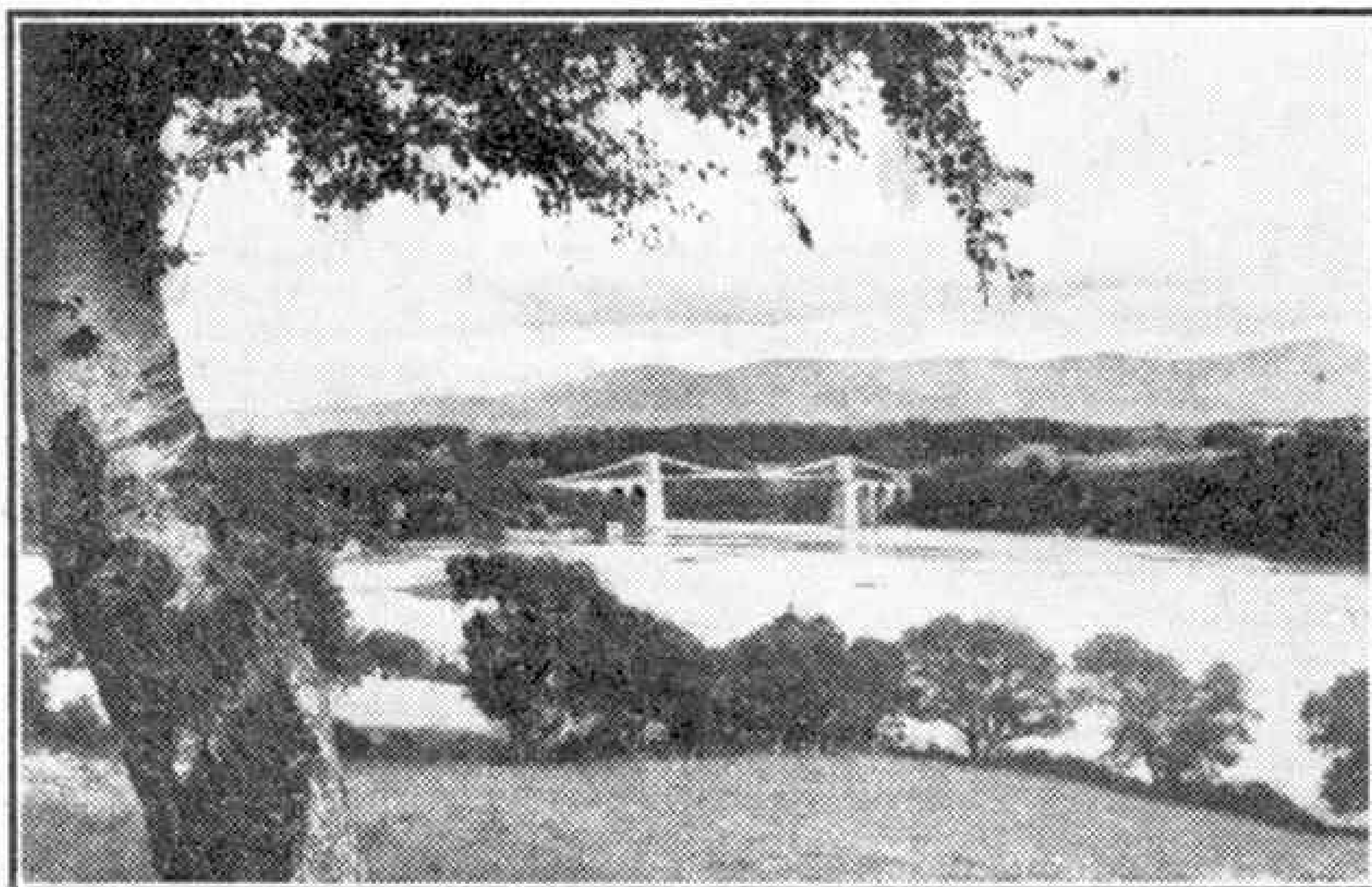
impression of Nelson scanning the Menai Strait, looking for any trouble which may crop up. The full name of Llanfair, by the way, is Llanfairpwllgwyngyllgogerychwyrndrobwlllantysilliogogorchoch.

Ferry services run from Caernarvon, Port Dinorwic and Bangor to various small landing stages on the Anglesey side. Beaumaris is a very picturesque town of Anglesey, right opposite Bangor. Farmers use the ferries extensively, especially on Saturday.

There is some fishing in the Menai Strait, especially during September and October when cod, bass and pollack are plentiful. Salmon fishing is still carried on, using the old fashioned "seine net" fishing principle.

Four fishermen with their net and boat set out when the tide is at its lowest ebb. One man stands on the water's edge, having one end of the long net close to him, attached of course to a rope. He holds this while his colleagues row out in a circular course, letting out the net as they do so. The boat returns to the first fisherman, leaving the net, now well out in the channel, more or less in a circle. This is weighted at the bottom, but has thick corks at the top so that the upper

(Continued on page 334)



The Menai Strait Suspension Bridge as seen from the Anglesey side of the Strait, with the mountains of North Wales in the distance.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With certain exceptions, which will be indicated, these should be ordered through a bookseller.

"SMITHS AT SEA"

(Robert Ross & Co. Ltd. 4/- net)

Everyone was thrilled to learn a year or two ago that the Atlantic had been crossed in a boat only 20 ft. in length, one of the smallest ever to complete this voyage. The wonder grew when it was learned that the Smith brothers who made the crossing had built this boat themselves in Halifax, and admiration for the feat is increased by the story of the adventure told by Stanley Smith in this booklet, published by Robert Ross and Co. Ltd. in association with the well-known firm of Harraps.

The booklet is of handy size. It is written for high spirited children, and both they and their parents will thoroughly enjoy the brief but racy account given in it of the building of the tiny boat, its equipment and its navigation across the Atlantic. Light-hearted sketches by the author himself give some idea of the tribulations endured on the voyage and of the many things seen by the adventurers, who discovered that the Atlantic is by no means a complete desert.

A delightful little book, concise and to the point, and full of the real spirit of adventure.

"SCALE MODEL SHIPS"

By BERNARD REEVE and P. W. THOMAS
(Sidgwick and Jackson. 20/-)

Who does not stop to look, if only for a moment, at a fine model of a magnificent liner displayed say in the window of a shipping office? To aspire to build one like it is a high aim that few can realise. As the authors of this book point out, however, there is no reason why the amateur ship modeller should not endeavour to make models in keeping with the work of the professional, and their production is intended to help him in this ambition.

There are two main sections to the book, dealing with scale model ships and the machinery for their propulsion respectively. In the first of these tools and equipment, hull construction and design, and the making of miniature ships' fittings are dealt with. There are fascinating details, too, of the different classes of ships and a special chapter on historical vessels. In the power plant section attention is given to steam and internal combustion engines, and to electric motors, with useful guidance on propellers, shafting and installation.

There are many illustrations, beginning with a picture of a fine model of Shackleton's "*Nimrod*," and including an abundance of good drawings and sketches.

"THE BRYDONS GET THINGS GOING"

By KATHLEEN FIDLER
(Lutterworth Press. 7/6 net)

Here are the Brydons again, Simon and Roger, Dan, Ruth and Susan, with the faithful Marsdie, and all who have become friends of the family through listening to their radio adventures will enjoy these further tales.

Dan, as usual, makes trouble in spite of good intentions, this time by mistakenly "oiling" all the clocks with varnish and of course stopping them. He then has the bright idea of buying a new clock in an auction sale, at which he finds himself landed also with an old chair, a zinc bucket, a brass bell and a few other unwanted odds and ends. But the old chair turns out to be the lurking place of a missing will, so Dan's good intentions are realised, though in a very unexpected direction.

A fine local concert organised by Roger provides more fun, and the interest of the stories is increased by the excellent illustrations.

"DANGER AHEAD"

By RICHARD BLYTHE
(Newman Neame. 10/6)

The safety of British railway travel is a byword; during 1949 some 1,634 million passenger journeys by rail were made without fatal accident. This degree of safety is due very largely to the signalling system, the growth of which from very crude beginnings to the highly organised system and equipment of to-day forms the theme of this book.

In spite of its forbidding title, which seems at variance with the safety angle, the book succeeds in tracing the development not only of signalling, but also of various other aspects of the railway working. Thus after dealing generally with the introduction of railways and the methods of the early days, the advances in speed and in the volume of traffic are described, with an account of the signalling improvements necessary to keep pace with them and to ensure safety. Modern equipment and operation, including the use of light signals, electric signalling and automatic train control, bring the story up to date, while in the final chapter views on possible future developments are expressed.

The book is illustrated by several coloured drawings and a number of black and white pictures, and an index for ready reference completes the contents.

"BOMBA THE JUNGLE BOY"

By ROY ROCKWOOD
(Ward Lock. 6/-)

Bomba is a white boy who has lived all his life in the Amazonian jungle and understands the ways of the birds and animals he meets there. He has become a screen personality as well as the hero of a series of adventure stories, of which this is the first. In it we meet him at home in the jungle, with an aged naturalist as his only companion. They are threatened by hostile Indians, but Bomba outwits them and gives aid also to Europeans who had been captured by the natives, in a series of events that lead him to the home on a volcanic mountain of a great native medicine man. There he hopes to learn something of his own origin, but a giant volcanic outbreak engulfs the medicine man before he can reveal the secret.

A frontispiece shows Bomba as he appears in the film.

"THE OBSERVER'S BOOK OF BRITISH ARCHITECTURE"

By J. PENOYRE, A.R.I.B.A. and M. RYAN, A.R.I.B.A.
(Warne. Price 5/-)

The enjoyment of visiting famous cathedrals, churches and historic buildings is greatly increased if one knows something of the architecture of the period concerned, and of the conditions on which the style was founded. This welcome addition to the series of Observer's Books describes the development of English architecture from Saxon times until the present day, and provides the observer with just the background he needs to enable him to follow the development of building, planning and technique through the centuries without becoming confused with unnecessary detail.

The text is supplemented by 270 excellent drawings, 125 of them partly in colour, illustrating distinguishing features of the architecture of the successive centuries, and ranging from interior glimpses of 12th century cathedrals to modern blocks of flats. About half of the drawings are grouped, without text, in a "Visual Index" that occupies the last 50 pages of the book and enables one to quickly identify any style of architecture from 12th to early 19th century.

"THE LONDON, TILBURY AND SOUTHEND RAILWAY"

By H. D. WELCH
(The Oakwood Press. 5/-)

This book forms No. 8 of the Oakwood Library of railway history. It deals with a line that had marked characteristics during its independent days, many of which were retained to some extent after its absorption in 1912 by the Midland Railway and later under the L.M.S.

The line was built to carry Londoners to Tilbury, for the ferry to Gravesend, and it was hoped also to carry imports from Thames Haven. Neither traffic developed in the manner hoped for, but the growth of Southend, which had been of quite secondary importance in the original scheme, provided much of the railway's prosperity. Its trains were punctual, in spite of operating difficulties, and the company was one of the first to have all its passenger stock lit electrically. Except two, all its locomotives were of the tank type. For a long time they were of one wheel arrangement only, and the 4-4-2 tanks built by the L.M.S. as late as 1930 were still essentially of the large Tilbury design, with only minor Derby modifications.

The story of the development of the line, with its many curious and interesting features, is told by Mr. Welch in entertaining fashion. A noteworthy point is that it had no London terminus of its own, but had connections with all its neighbours, and throughout its life one or other of these was proposing to absorb it. When it did lose its independence it was the Midland that took it over, not any of the companies that had been suggested, but last year it was transferred to the Eastern Region, so that in a way one of its neighbours, the Great Eastern, acquired it after all.

There are many illustrations, with section maps. A complete list of Tilbury locomotives also is included, giving their original numbers and names, and detailing their subsequent numbering history under the Midland and the L.M.S.

"HOW TO RECOGNISE YOUNG BIRDS"

By ERIC POCHIN
(Brockhampton Press. 3/6 net)

We have already reviewed interesting books on the recognition of birds by Mr. Pochin, and here is another one in the "Young Naturalist" series, dealing with baby birds. The story is a really fascinating one, with concise descriptions of a host of young birds, grouped in accordance with their occurrence. We begin with the birds of the garden, wood and hedgerow and of the open fields, continue with those from near water, on mountains, moors and marshes, and on sea cliffs and shores, ending with the birds that are usually met with in and around buildings.

There are 124 pictures in colour that will provide useful guidance in recognition, and the book is one that will be appreciated by all youthful bird lovers, and indeed by many of riper years.

"SNOWSTONE"

By J. M. SCORR
(Brockhampton Press. 6/-)

This is a book in which all boys will revel, for it combines struggle and adventure with an authentic background in Greenland, described vividly by an author who is himself a famous explorer, familiar with the snow and ice of that Arctic land.

The adventure comes with a search for snowstone, a mineral found only in one place in the frozen North that promises to revolutionise the production of aluminium. The secret of its existence had leaked out to unscrupulous rivals, who also set out for Greenland to find the vein in which it occurs and are prepared to stop at nothing to destroy the discoverer and his companions and to ruin their hopes. How they seem to have accomplished their task, and how they are baffled at the very last moment, makes a really exciting finish to a thrilling book.

"ROMNEY, HYTHE AND DYMCHURCH RAILWAY, GUIDE AND TIMETABLE"

(Ian Allan Ltd. 6d.)

Although this is described as a guide and timetable, it will give many railway enthusiasts considerable pleasure, for it is a timetable with a difference. Not only does it include details of the train services provided by the "World's Smallest Public Railway"; it tells the story of the line as well.

How this railway came into being, its opening in 1926, its pre-war progress, its war effort and its post-war revival are all described. So are its one-third full size steam locomotives, and the many working models of ancient and modern locomotives and trains and the Gauge 0 miniature to be seen in Model Land at the side of the railway itself. There are several good pictures taken on the line and in its stations, sheds and locomotive shops, but unlike most timetables, this one has no map to help its user to appreciate the system better.

**"THE BOOK OF POWER"
"THE BOOK OF VISION"**

By JOSEPH LAWRENCE
(Warne. 5/- each)

Mr. Lawrence has produced two excellent books, written specially to provide young readers with fascinating glimpses of some of the marvels of modern science and engineering. The pages are large, giving ample room for the excellent drawings by Victor Carr that contribute very largely to the understanding of the text.

Mr. Lawrence has great confidence in the capacity of boys to grasp new ideas and new terms, and he has not hesitated to deal with the most interesting of modern developments. In the first of his books he begins by giving simple examples of the use of power in the home, in which coal plays so great a part, and this allows him the opportunity of explaining how the Sun is responsible for nearly all the sources of power that we use, including the wind, tides, coal and oil, while atomic power makes use of changes of a type that give the Sun itself its immense radiating power. In turn we follow the development of wind and water power, see how coal is used, how the steam engine works, how electricity is generated, and how oil is used in internal combustion engines, rockets and jet engines. An account of the transmission of power follows, and finally we return to the days before engines were invented, and learn something of animal and human power, with many interesting pictorial comparisons.

"*The Book of Vision*" deals with the ways in which we make use of light. The development is excellent, beginning with the uses of mirrors and lenses, and giving some idea of the working of the eyes of living creatures of all kinds. From this we pass to the development of telescopes and microscopes, the uses of prisms and the applications of our knowledge in photography. Sections on the electron microscope and the wonders of radar complete a fine book.

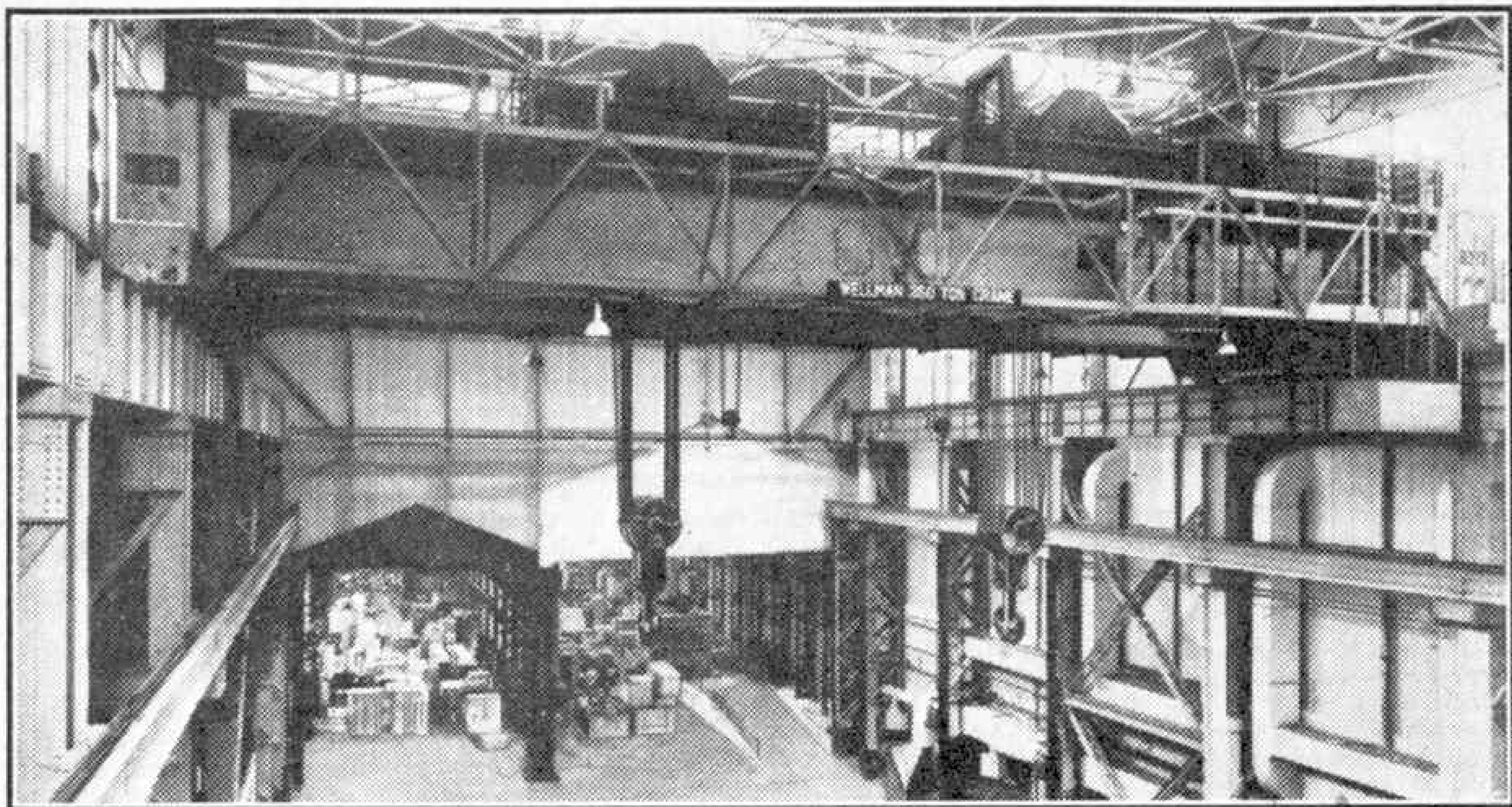
There are excellent coloured plates in both books, but one illustrating the formation of secondary rainbows in the second is somewhat misleading.

"BOOK OF ENGINEERING WONDERS"

By VICTOR CARR
(Warne. 5/- net)

Mr. Carr, who contributed the illustrations to the books on Power and Vision already mentioned, has written and illustrated a companion volume on engineering wonders. In it he describes about 20 examples of modern engineering, most of which we are liable to accept as familiar without enquiring too closely into their working; and the result is a book that will be absorbingly interesting to younger readers.

The examples are well chosen, ranging from the locks that enable ships or barges to climb hills to the jet-propelled aeroplane, the latest wonder in the conquest of the air. In all cases there are ample illustrations.



The Wellman 350-ton crane installed in the new assembly and test house at the Stafford works of the English Electric Company Ltd. Photographs by courtesy of the Wellman Smith Owen Engineering Corporation Ltd.

A Giant Overhead Travelling Crane

Lifts up to 350 Tons

THE English Electric Company Limited have built a new assembly and test house at their Works in Stafford. In this it is necessary to handle heavy power generating sets of various kinds, particularly hydrogen cooled alternators; and to allow this to be done as speedily and as conveniently as possible a giant overhead travelling crane has been installed. The crane was designed and built by the Wellman Smith Owen Engineering Corporation Limited. It can handle a total load of 350 tons, and if desired an overload of up to 400 tons can be dealt with.

The accompanying illustrations give some idea of the general layout and dimensions of this giant crane. Its girders are 81 ft. in length. They are built up of two separate units, each consisting of a main girder, of double web plate riveted construction and a lattice braced outrigger girder. The girders of each unit are braced horizontally and vertically to give them rigidity, and are mounted in box section end carriages. These are supported on gantries with centres spaced 77 ft. 9½ in. apart. Each of the two gantries carries two rails, set 15 in. apart, and the crane travels along these rails on 24 flanged wheels, six pairs in each of its

two end carriages. The height of the gantry rails above the floor level is 50 ft.

The lifting mechanisms of the crane are carried on two trolleys that run on rails fitted on top of the main girders of the crane structure, so that they can be moved to handle lifts in any part of the area covered. These rails are spaced 15 ft. 6 in. apart and are double, each trolley being carried on four pairs of flanged wheels. The hoisting mechanism on each allows a lift of 175 tons, and when lifts up to the maximum of 350 tons are required the two lifting units are linked by a cross-beam. The huge ramshorn hooks of the lifting gear are of forged steel, each carried by a double row ball thrust bearing.

In addition to the main lifts there are two auxiliary hoists for dealing with smaller weights, including in particular the heavy slings that are required for lifting loads on the main hooks. These auxiliary hoists have a capacity of five tons each.

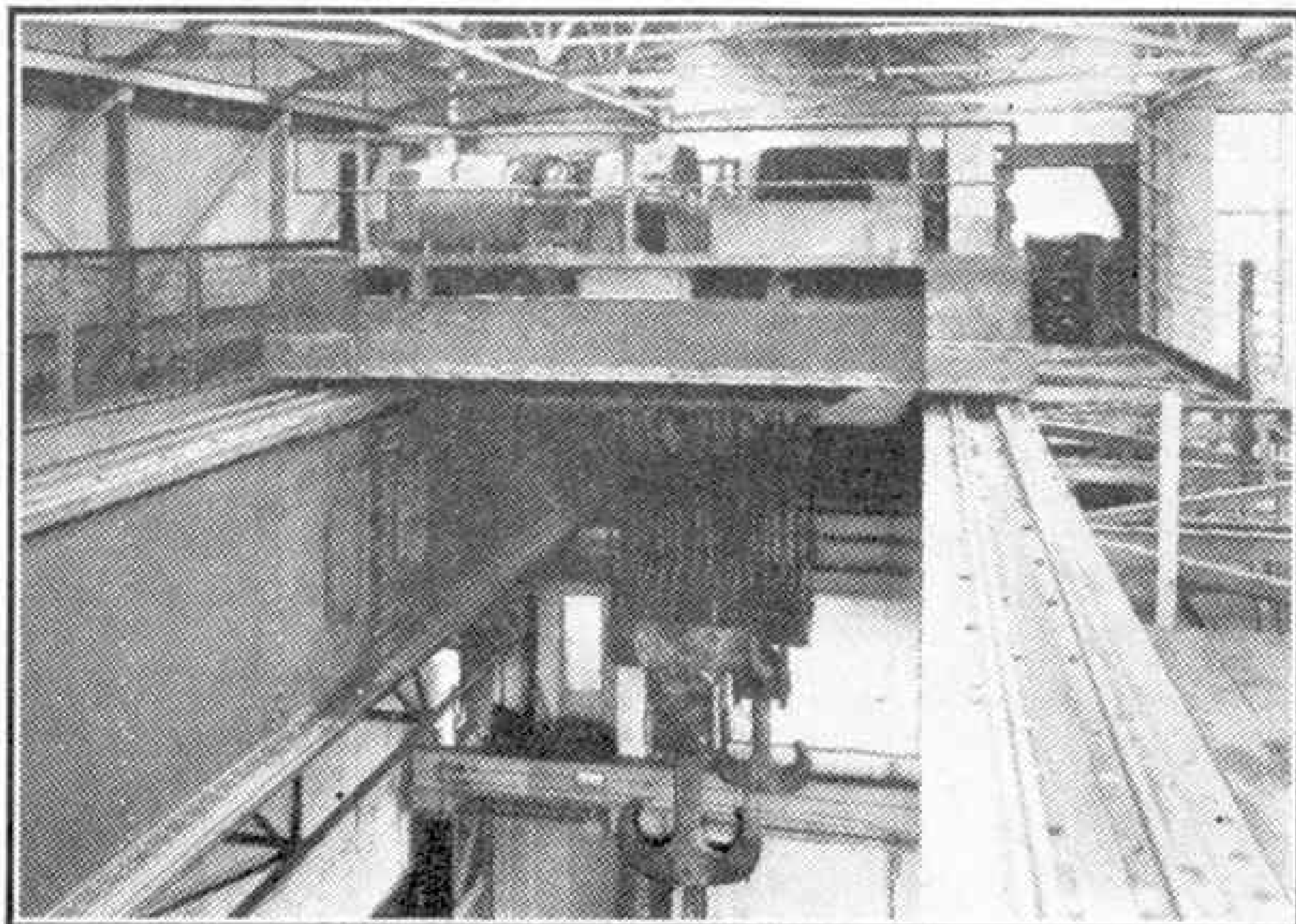
The main hoisting gear on each of the trolleys consists of cast iron barrels, two on the main hoist and one on the auxiliary hoist. These are provided with grooves for the hoisting ropes and are of sufficient size to allow the whole of the rope for

the full range of a lift to be wound on in a single layer without overlapping. The ends of the ropes are anchored to the barrels, and additional security is given by the fact that three extra coils of rope are left on the barrel when the lifting hook is in its lowest position.

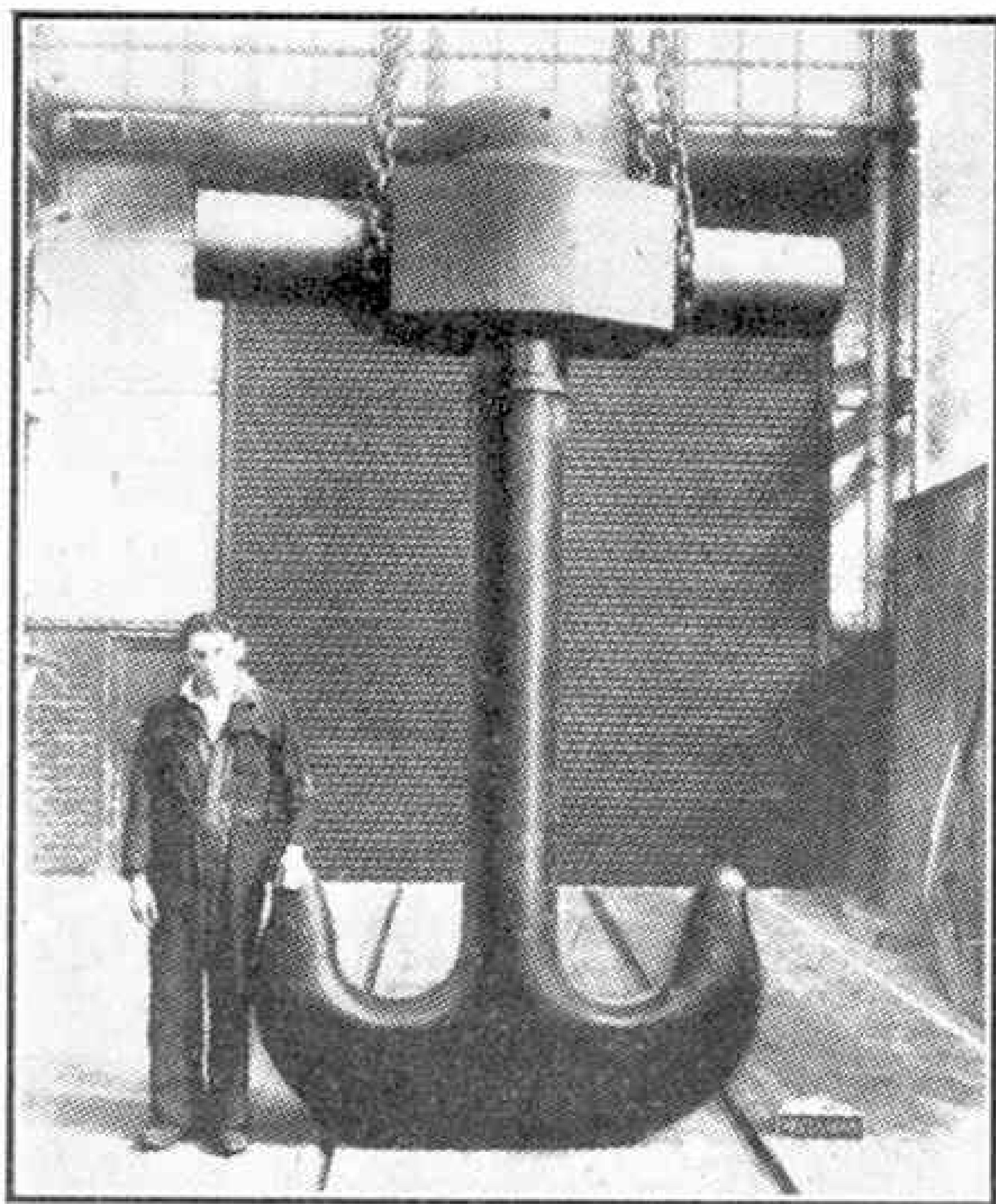
The travel of the crane along the gantries, the movements of the trolley on the crane itself, and the hoisting are all carried out by means of electric motors supplied by the English Electric Company Ltd. The main hoists are driven through reduction gearing by 90 h.p. motors running at 700 r.p.m., and their giant loads can be hoisted at the rate of 5 ft. a minute. For the auxiliary hoists there are 30 h.p. motors, and the lighter loads they handle can be raised at a speed of 60 ft. a minute. The trolleys themselves are moved as desired by means of a 30 h.p. motor, which gives them a speed of 55 ft. a minute.

The highest powered motor in the crane is that giving the long travel motion,

that is the movement of the entire structure along the gantries. This is of 120 h.p. It drives one double pair of wheels in each end carriage, acting through a cross shaft and spur rings; and it is



End view of one of the two trolleys of the Wellman 350-ton crane, showing the twin rail sets on which they run. Below are the hooks of the two 175-ton lifts they provide.



For loads up to 350 tons the two 175-ton lifting units are linked by a cross beam bearing the great hook seen in this illustration. It is over 11 ft. in total length.

fitted about the centre of the span to ensure that the drive is transmitted simultaneously to both end carriages. It gives the crane speeds along the length of the shop from 165 down to 115 ft. a minute, depending on the load carried.

Each motion has means of braking and control. Magnetic braking is provided for the hoists, and the lowering of loads is controlled electrically by means of dynamic braking. The long travel motion along the length of the shop is equipped with a hydraulic electric brake. This brake is so connected that it remains off in normal use; it can be applied at will by the driver through a foot pedal, and comes into action automatically on current failure, or on pressing an emergency stop push button. Overloading of any motor automatically opens a circuit breaker, which does not reclose until all controls are brought to the "off" position.

The total weight of the crane with the cross-beam is 250 tons. In its erection a special 120 ft. derrick capable of lifting 60 tons was used. The end carriage half lengths were first lifted on to their tracks and suitably spaced apart to allow the main girders to be fitted. As each girder was raised into position it was bolted to its own end carriage sections, the distance between the girders (Continued on page 334)

Shipping Notes

Spring Cleaning

Those who enjoy trips on the vessels of the British Railways Firth of Clyde Fleet seldom realise how much work is done during the winter months to prepare them for the warmer days of spring and summer. The illustration on this page shows "*Jeanie Deans*" in the Kelvin Drydock, Pointhouse, for survey and overhaul, where she was succeeded by "*Waverley*." Six vessels of the fleet were given their spring cleaning in Lamont's Yard, Port Glasgow; the Ayr Engineering and Construction Company dealt with "*King Edward*" and the other turbine steamers, and the "*Duchess of Montrose*" was overhauled by the Ardrossan Dockyard Company.

The work on each vessel took five or six weeks to complete. Each was painted and redecorated, and necessary repairs and replacements were effected.

Great Shell Tanker Programme

The Shell Company have embarked on the world's largest oil tanker building programme since the war. This provides for the construction of 41 general purpose tankers of 18,000 tons dead weight of entirely new design, and five tankers of 28,000 tons dead weight; and the total tonnage is about equal to that of the entire Shell fleet of 1930. Of these vessels 31 are being constructed in British yards and 15 in the Netherlands, and deliveries will begin next year.

The new type of general purpose tanker is 557 ft. in overall length, with a beam of 69 ft. The maximum designed working shaft horse power is 8,300, and the service speed 14½ knots. Four of the vessels will have turbo-electric drive and the remainder will be geared turbine ships. Increased pumping capacity is being installed, and the tankers will be able to discharge cargo and complete a turn round within 24 hours.

The design of the five 28,000 ton tankers will be based on that of the "*Velutina*" and her three sisters, described in the "*M.M.*" for January last.

A Novel Launching Device

An interesting development in launching practice is the use of steel balls on the launching ways. These have been introduced in Japan, where such materials as grease, tallow and paraffin have been unobtainable. Small vessels were launched by means of tracks and rollers, and even by large cranes, but these methods could not be used for larger vessels such as the "*Yama*" a vessel 436 ft. long and of 3,770 tons launching weight, and for them the new system was introduced.

The steel balls are fitted in holders and rotate in special tracks on the ground and sliding ways. Launching arrangements are similar to those usually employed, the balls and tracks merely replacing the usual lubricants. Two types of holders are used, one with two rows of balls and the other with three rows. The balls themselves are made of steel and are 3½ in. in diameter, and the number used in launching the "*Yama*" was 2,616. For a larger vessel, the "*San Pedro Maru*," with a launching weight of more than 6,000 tons, 3,402 balls were employed.

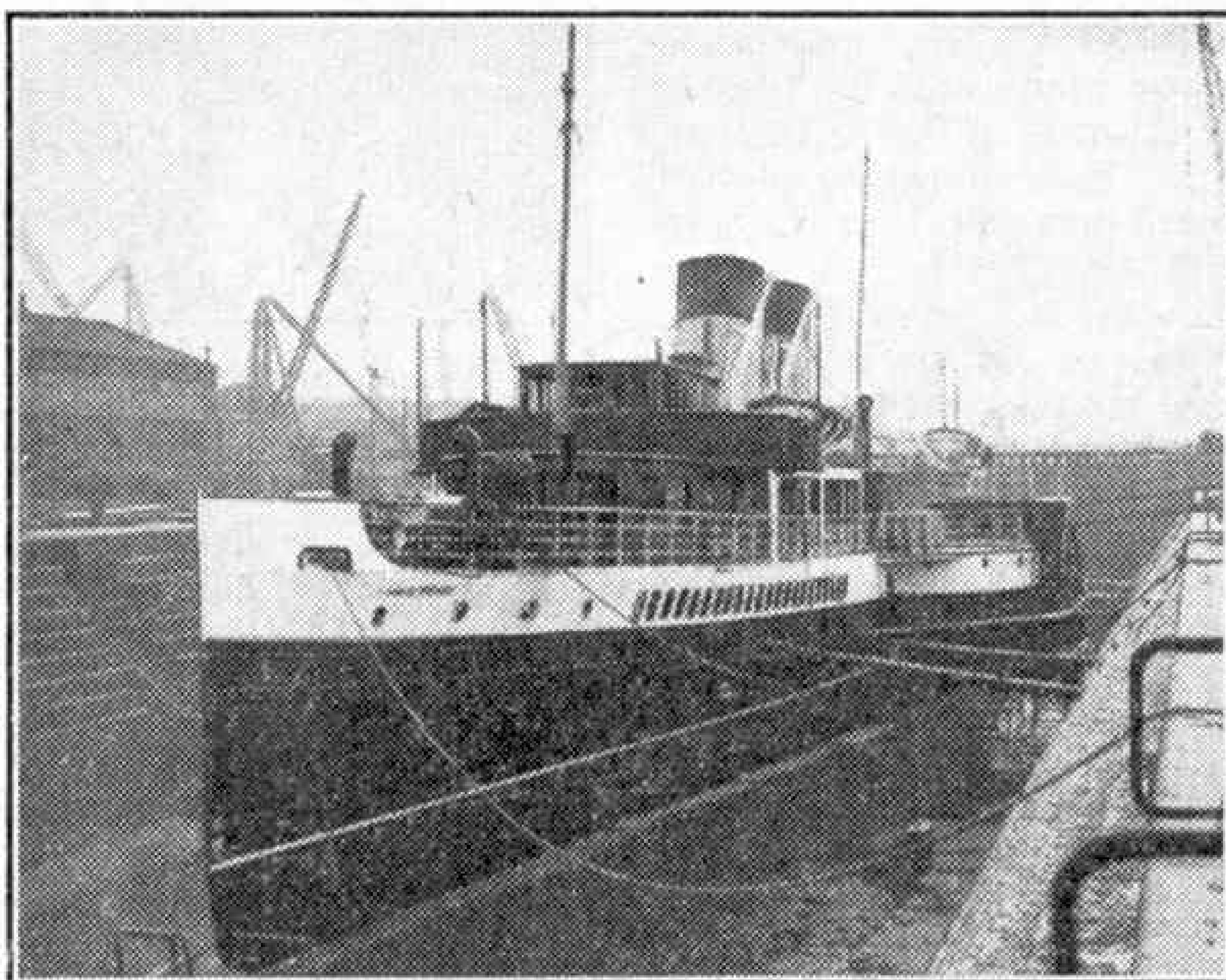
British Railways Train Ferry

British Railways are introducing a new ship for the Train Ferry Service between Harwich and Zeebrugge. It was launched in March last at the yard of John Brown and Company Ltd., Clydebank, when the name "*Norfolk Ferry*" was given to it. The new vessel will be a welcome addition to the service on which the "*Essex Ferry*" and "*Suffolk Ferry*" were already engaged.

A distinctive feature of the vessel, already applied with good effect on the "*Suffolk Ferry*", which was completed at Clydebank in 1947, is that the upper deck extends for almost the whole length of the vessel. It serves as a cover for the train deck, on which the rail vehicles carried are secured. There are four lines of railway track, on a deck specially constructed to be capable of supporting the weight of the heaviest type of modern locomotive. These lines converge into two embarkation tracks at the after end of the vessel.

The Isle of Skye Ferry Service

A new vessel for service between the Kyle of



The "*Jeanie Deans*," of the British Railways Clyde Fleet, undergoing survey and overhaul in Kelvin Drydock, Pointhouse. British Railways Official Photograph.

Lochalsh and Kyleakin, in the Isle of Skye, has been built for British Railways by Wm. Denny and Brothers Ltd., Dumbarton. This is the second of two vessels designed for this service, and as it is smaller than the one previously ordered it was given priority in construction to be ready for the summer traffic.

The vessel is primarily intended for the transport of vehicles and is equipped with a turntable, taking a load of eight tons, with space for two motor cars or one lorry. It also carries passengers, and when employed exclusively for this service will carry 100.

The overall length of the new ferry is about 44 ft. and the breadth 17 ft. 6 in. It is powered by a 36 b.h.p. Gleniffer high speed diesel engine.

Union Castle Line Steamship

Two further vessels are being completed for the Union Castle Line by Harland and Wolff Ltd., Belfast. They are intermediate vessels of 17,300 tons, built for the round-Africa service of the Line, and are the "*Rhodesia Castle*," launched in April, and her sister ship the "*Kenya Castle*," the launch of which was due a month or so afterwards.

Gauge 0 "Dublin and Kingstown" Train

THE gauge 0 engine and train shown in the pictures on this page belong to the remarkable collection of models of historic rolling stock on the layout

The slide valves of the original engine too were actuated in a curious way. A long rod attached to a short-throw arm on each bell crank worked on hollow rocking shafts fitted across the footplate behind the boiler. The actual valve rods were hooked by the driver on the top or bottom stud of a rocker on the end of the rocking shafts, according to whether the engine was required to go forward or backward.

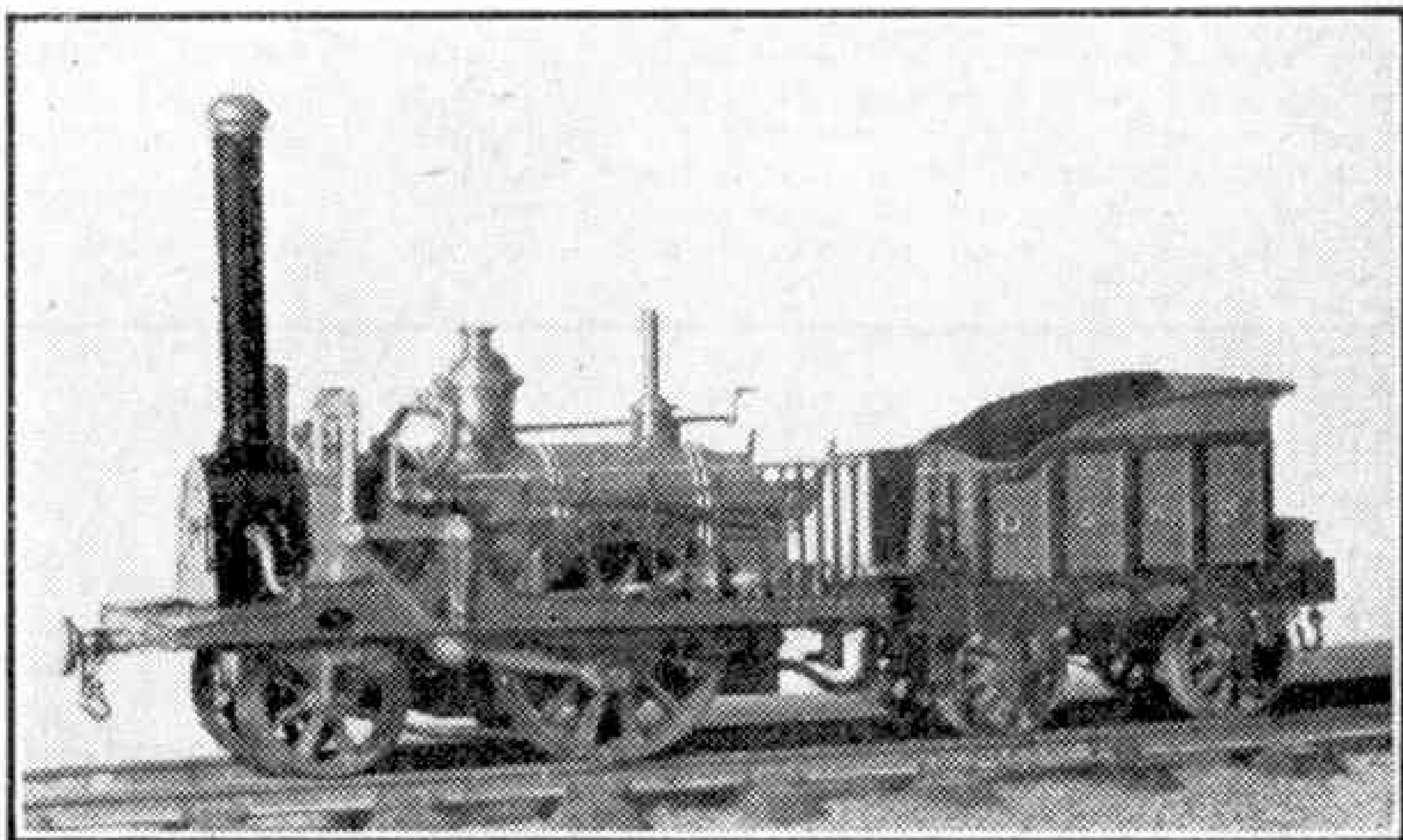
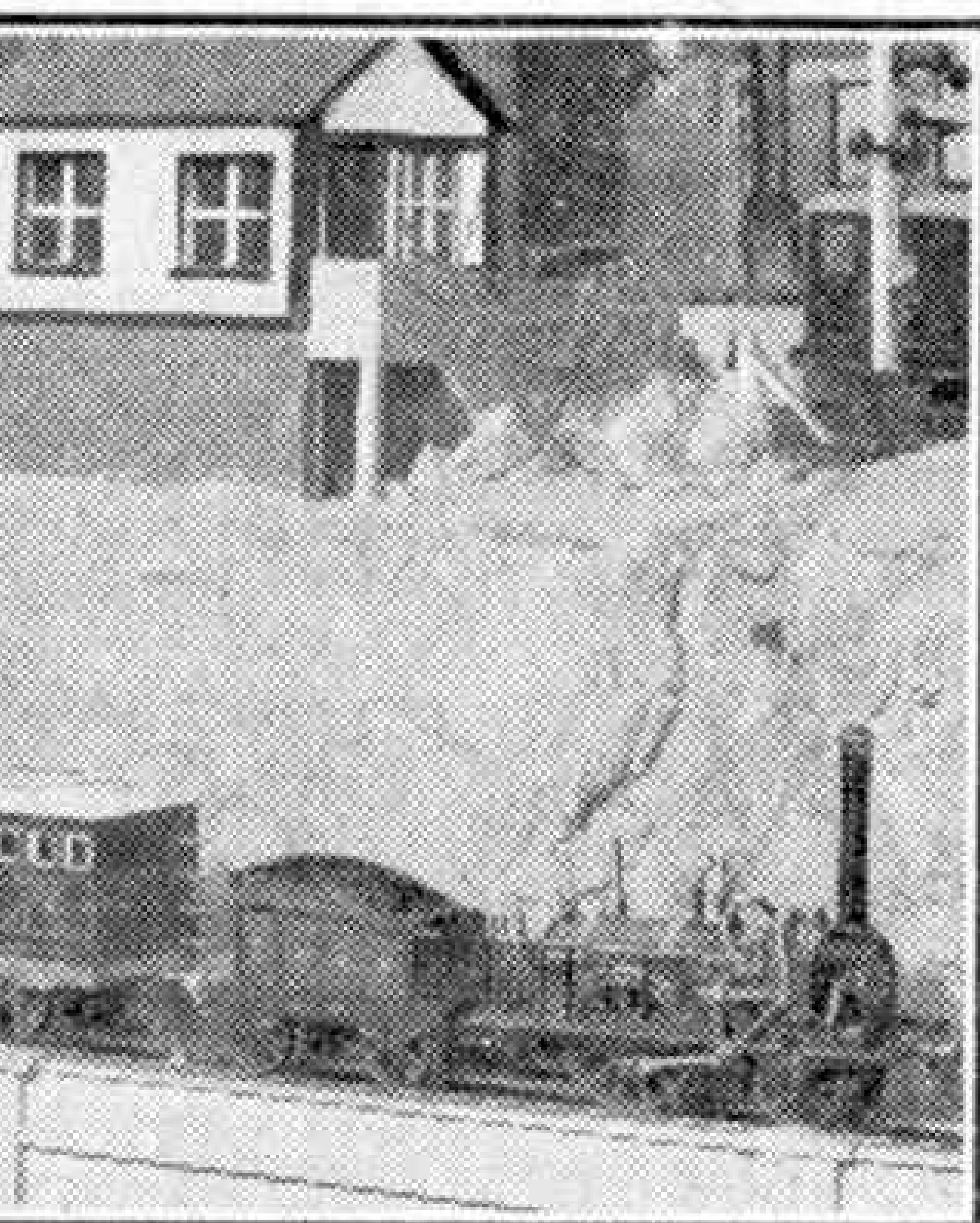
Each of the four miniature carriages represents a different type. These are respectively a first-class, a second-class closed, a second-class open, and a third-class open.

On the real carriages there were centre buffers with a swivelling yoke round their necks. There was a two-link chain and a hook hanging on one side and a two-link chain and a ring on the other side. This arrangement was known as "Bergin's Patent Buffing and Draw Gear." On the carriages, two buffer heads were mounted on the extremities of a long rod which was kept centralised in the underframe by long spiral springs which absorbed jerks or buffing shocks and ensured comfortable travel.

The Gauge 0 Dublin and Kingstown period train running on the layout of Mr. C. L. Fry, Dublin. The train makes a remarkable contrast to modern stock.

of Mr. C. L. Fry, of Dublin. The engine is a model of "*Hibernia*," the first locomotive to run in Ireland, on the Dublin and Kingstown Railway. This was built by Sharp, Roberts of Manchester, and, as it is said, tried out on the Liverpool and Manchester Railway before shipment. The Dublin and Kingstown rail gauge was then the same as the standard English gauge, 4 ft. 8½ in., and was not altered to the Irish standard gauge of 5 ft. 3 in. until 1856.

"*Hibernia*" had many unusual features. The vertical cylinders were placed over the leading axle, and drove the rear wheels by means of a bell-crank arrangement. These features are included in the model, and it is truly fascinating to see the little reverse levers on the footplate, and the bell cranks, working. Actually the miniature "*Hibernia*" can pull five modern scale model coaches, representing 135 actual tons, at a scale speed of about 20 m.p.h.



Mr. Fry's model of "*Hibernia*," the first Irish railway engine. The bell-crank driving gear and various connections all work when the engine is in motion.



Auster "Aiglet" used for the crop-spraying operation described below. The photographs on this page are reproduced by courtesy of the Shell Petroleum Co. Ltd.

Air News

By John W. R. Taylor

"Fireflies" for Denmark

Fairey "Firefly" Mk. 1 target-towing aircraft have been ordered by the Royal Danish Air Force, following two years' successful operation of a fleet of these aircraft by the Swedish Flygtjänst Company, under charter to the Swedish Armed Forces.

The "Firefly" target tug is basically similar to the well-known Mk. 1 two-seat reconnaissance fighter, the first British aircraft used in action over North Korea. Chief modifications include removal of guns and operational equipment, and fitting of a standard target winch and windmill winding-in gear at the rear cockpit. Any type of sleeve or glider target up to 32 ft. span can be towed for air-to-air or ground-to-air firing practice.

Auster Crop-Spraying

The crop-spraying version of the "Aiglet" light 'plane illustrated on this page has been built by Auster Aircraft to the design of Aerial Spraying Contractors Ltd., of Boston, Lincs., who used three "Aiglets" to spray 17,000 acres of last season's cotton crop in the Sudan. The operation was one of the biggest and most difficult ever carried out by fixed-wing aircraft outside the United States. To start with it involved a 3,200-mile flight from Britain to Khartoum, and subsequent spraying was complicated by the fact that the cotton Jassid insect pest lives and feeds entirely on the underside of the leaves.

The spraying proved completely successful, the

"Aiglets" performing perfectly under trying conditions, which sometimes involved taking off and landing five times an hour for several hours. Up to 280 acres were treated during each flight, at a cost very much lower than that quoted for spraying by helicopter.

375 Polar Flights

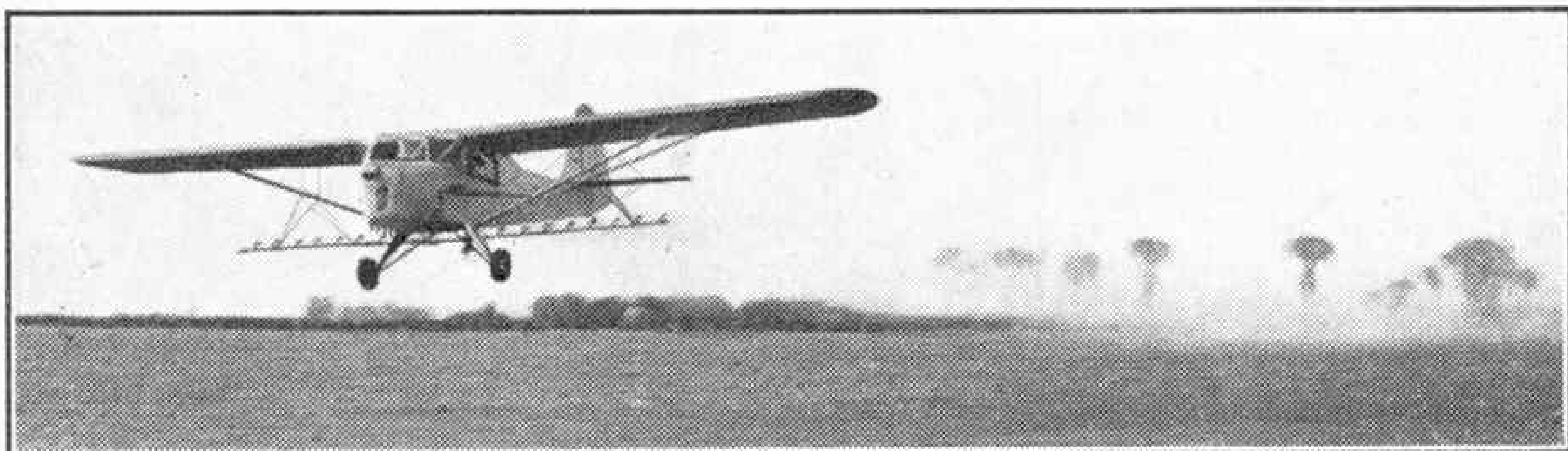
The U.S. Air Force have made more than 375 flights from Alaska over the North Pole and back, according to Col. Bernt Balchen, the famous Polar flying expert, and more than 130 test landings have been made in the Arctic with ski-equipped "Dakotas." Col. Balchen also said that the U.S.A.F. have a weather station on an ice floe in the ocean about 200 miles north of Alaska, where weather observations are made and survival equipment for air and ground crews is tested.

Ovaltine by Air

Four days a week a Bristol "Freighter" of Australian National Airways takes off at 6.30 a.m. from Essendon Airport, Melbourne, with a consignment of empty cans for the Ovaltine factory at Devonport, Tasmania. After the cans have been unloaded on to a lorry at the airfield, the aircraft returns with a full load of Ovaltine for customers in Australia and for export overseas.

Until July 1950 Ovaltine was always sent by ship to Melbourne, but sailings were irregular and when production was doubled to meet Far East needs it was obvious that transport would prove troublesome. So the company decided to calculate the comparative cost of sending the Ovaltine by air. It worked out to within .01 pence per can of existing shipping and handling charges—so the "Freighter" got the job!

The French company Chargeurs Reunis S.A. have ordered two de Havilland "Comet" jet air liners.



The "Aiglet" in flight, demonstrating low-altitude spraying technique.

"Heron" in Production

As a result of overseas interest, the de Havilland company have put their "Heron" 14-17 passenger air liner into limited production. The "Heron," which was described in the September 1950 *"Air News,"* is an enlarged four-engined version of the popular D.H. "Dove," and uses many "Dove" components; production therefore should be comparatively easy. The prototype has completed over 300 hrs. test flying, including tropical trials in Africa.

A New Helicopter

Latest firm to enter the growing U.S. helicopter industry is McCulloch Motors, of Los Angeles, whose little MC-4 two-seat, tandem-rotor aircraft is illustrated here. McCullochs, who mass-produce about a million dollars' worth of chain saws and aircraft engines a month, began work on the MC-4 two years ago, with the object of producing a safe, cheap, efficient machine for the private owner and for commercial work such as crop-dusting, pipeline patrol, forest fire spotting and helicopter crew training.

The chief designer of the McCulloch Helicopter Division is D. K. Jovanovich, a pioneer of tandem-rotor helicopter design. His MC-4 is only 32 ft. 5 in. long and is powered by a 165 h.p. Franklin motor, which drives two rotors through a system of Vee-belts. Maximum speed is 100 m.p.h., and the MC-4 will cruise for 260 miles at 85 m.p.h. An outstanding feature of the prototype is its superb finish, both externally and internally.

Two MC-4s have been ordered by the U.S. Navy for development testing.

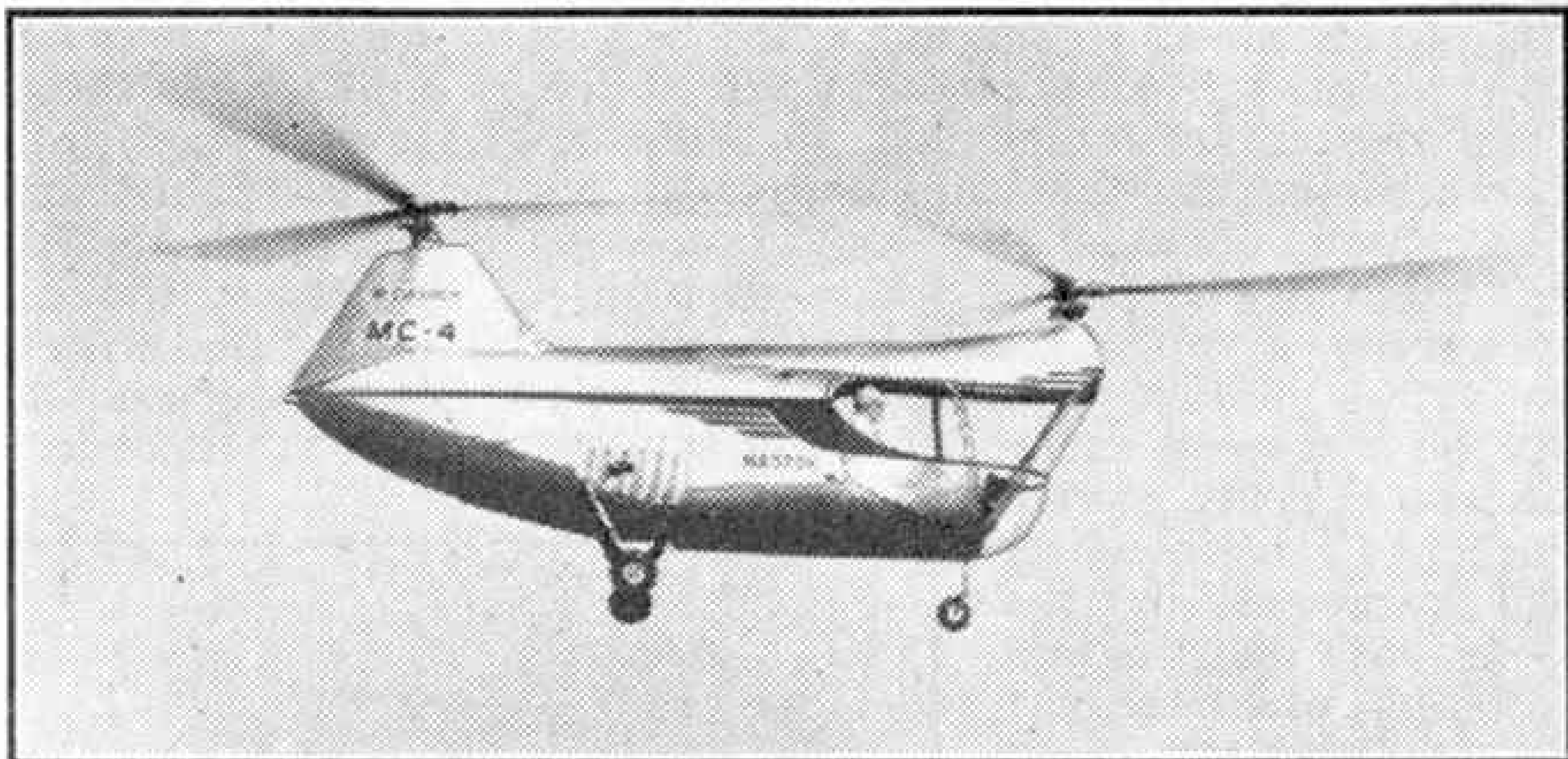
Gateway to the World

Figures issued by the Customs service show that more people than ever travelled by air last year, and that London Airport replaced Southampton as Britain's gateway to the world. In all, 520,000

passengers passed through London Airport, to and from every corner of the Earth, compared with Southampton's total of 375,000. Northolt Airport handled 576,000 passengers on short routes to the Continent and Eire.

Veteran Air Liners

The French airline, Aigle Azur, which operate services from Paris to points in Africa, have purchased



McCulloch MC-4 twin-rotor helicopter hovering during test flights. Photograph by courtesy of McCulloch Motors, U.S.A.

T.W.A.'s five veteran Boeing "Stratoliners." These aircraft carry about 50 passengers at 200 m.p.h. for ranges up to 1,800 miles, and have the advantage of being able to utilise many components of the "Flying Fortress" bomber, large stocks of which are still available.

The "Stratoliners" were the first pressurised air liners in the world when they entered service in 1940. After excellent work as military transports during the war, they returned to passenger-carrying on T.W.A.'s domestic services in the United States.

Sheep-Shearing Air Service

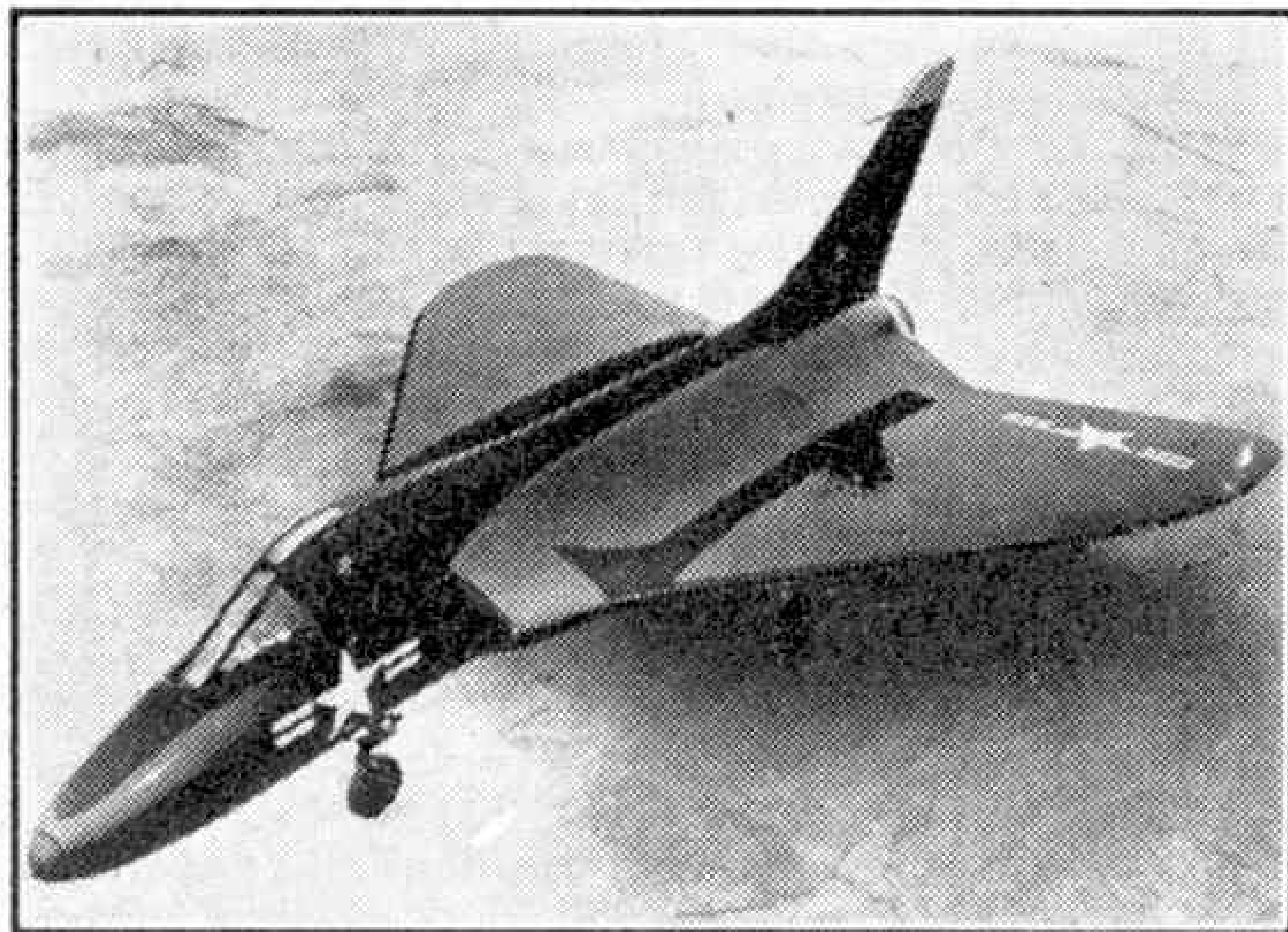
When thousands of sheep were floodbound in north-western New South Wales, seven tiny Auster aircraft carried teams of shearers to the rescue. The owners of the sheep wanted them shorn before the sheepflies attacked them. For five weeks the miniature squadron ran a shuttle service between the stations and shearing sheds to take food to the men. They also carried tents, tables, shearing equipment and cooking gear.

Delta Fighter

The Douglas XF4D-1, shown in the lower photograph on this page, is the first of a new generation of American Naval fighters designed to protect the fleet from attack by fast, high-flying enemy raiders. Based on the delta-wing formula, it is intended to be catapult-launched from aircraft carriers at the first report of an approaching raider and to climb rapidly to its operational ceiling. It is, in fact, an up-to-date version of the German idea of a short-range target defence fighter.

Nothing further may be said about the XF4D-1 at present, except that it made a successful first flight of 30 min. at Edwards Air Force Base, Muroc California on 23rd January last.

Air India International have increased the frequency of their "Constellation" services between the United Kingdom and India to four flights a week, each direction.



Douglas XF4D-1 Delta fighter. Photograph by courtesy of Douglas Aircraft Co., Inc., U.S.A.

The Battery Electric Vehicle

Silent and Reliable Delivery at Low Cost

By W. Anderson

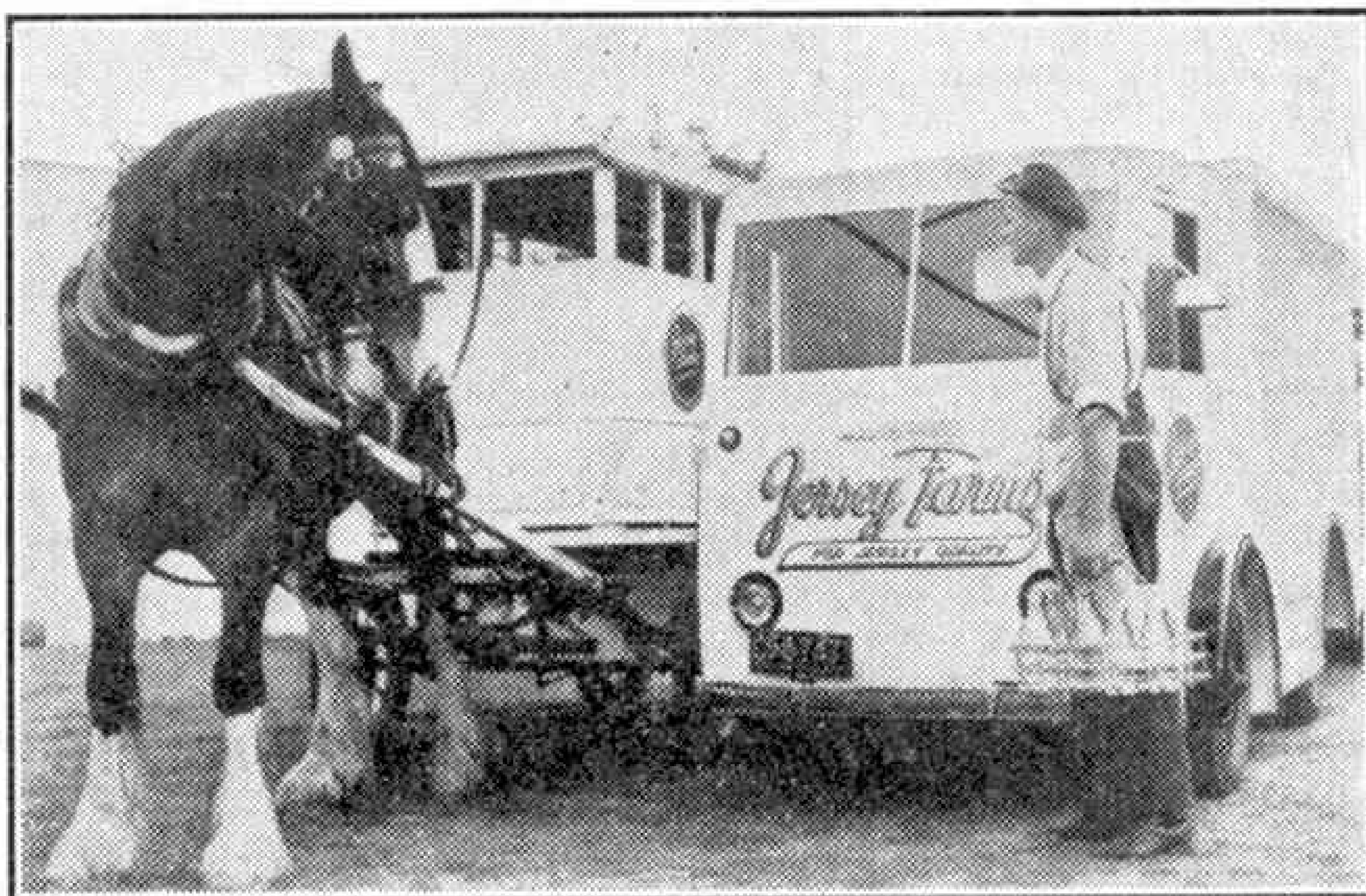
THE delivery of foodstuffs and other goods direct to the home has become an accepted feature of our national life, and we are now inclined to take for granted the van that calls daily with our milk and bread. The collection and distribution of these and other commodities naturally involves considerable expense, and the question of the transport that is to be employed must be closely studied.

A very great saving in costs can obviously be achieved in the field of door-to-door delivery, where the cost of delivering each and every pint of milk or loaf of bread to the consumer amounts to an annual bill running into several millions of pounds. It is in this particular service that the electric vehicle has proved to be the ideal form of transport, and indeed it was specifically developed for this purpose.

The electrically propelled vehicle in which the power is obtained from batteries actually carried on the machine is not a new idea, for the first experiments with street and rail cars of this type were being successfully carried out as long ago as the 1880s. At the beginning of this century electric broughams were in use in this country, and in Paris battery-driven taxi-cabs appeared on the streets. Since then considerable development has taken place and the modern battery electric delivery vehicle is distinguishable from the petrol-engined commercial van only in the type of fuel it uses.

Many readers will be familiar with the battery electric van and will have noted its characteristic appearance, slightly different from that of the ordinary motor van, and its silence of operation. Perhaps their own milkmen or butchers or bakers use such vehicles for delivery purposes,

either the normal four or even three wheeled types or, as is very common on milk rounds, the smaller short-range version, termed the pedestrian controlled pram, where the attendant walks while operating the truck by means of a tiller. Trolley buses and tramcars are similar in principle except that with them the power is supplied from overhead lines, and the Dinky Toys B.E.V. Electric Works Truck illustrates



Old and new side by side, a picture from British Columbia. The horse clearly disapproves of the newcomer, a 30 cwt. N.C.B. electric dairy truck. Photograph by courtesy of Smith's Electric Vehicles Ltd.

yet another development of this type of transport.

Horse transport, once very widely used, no longer has a place in our modern way of life, regrettable though this may be; and "electrics" are rapidly replacing horse runs on daily and weekly delivery and collection rounds. On an average two electric milk trucks can do the work previously carried out by three horses, and they do not require the services of experienced stable hands, now more difficult than ever to engage in towns. In addition they have not to be specially fed and watered over week-ends, nor do they fall sick.

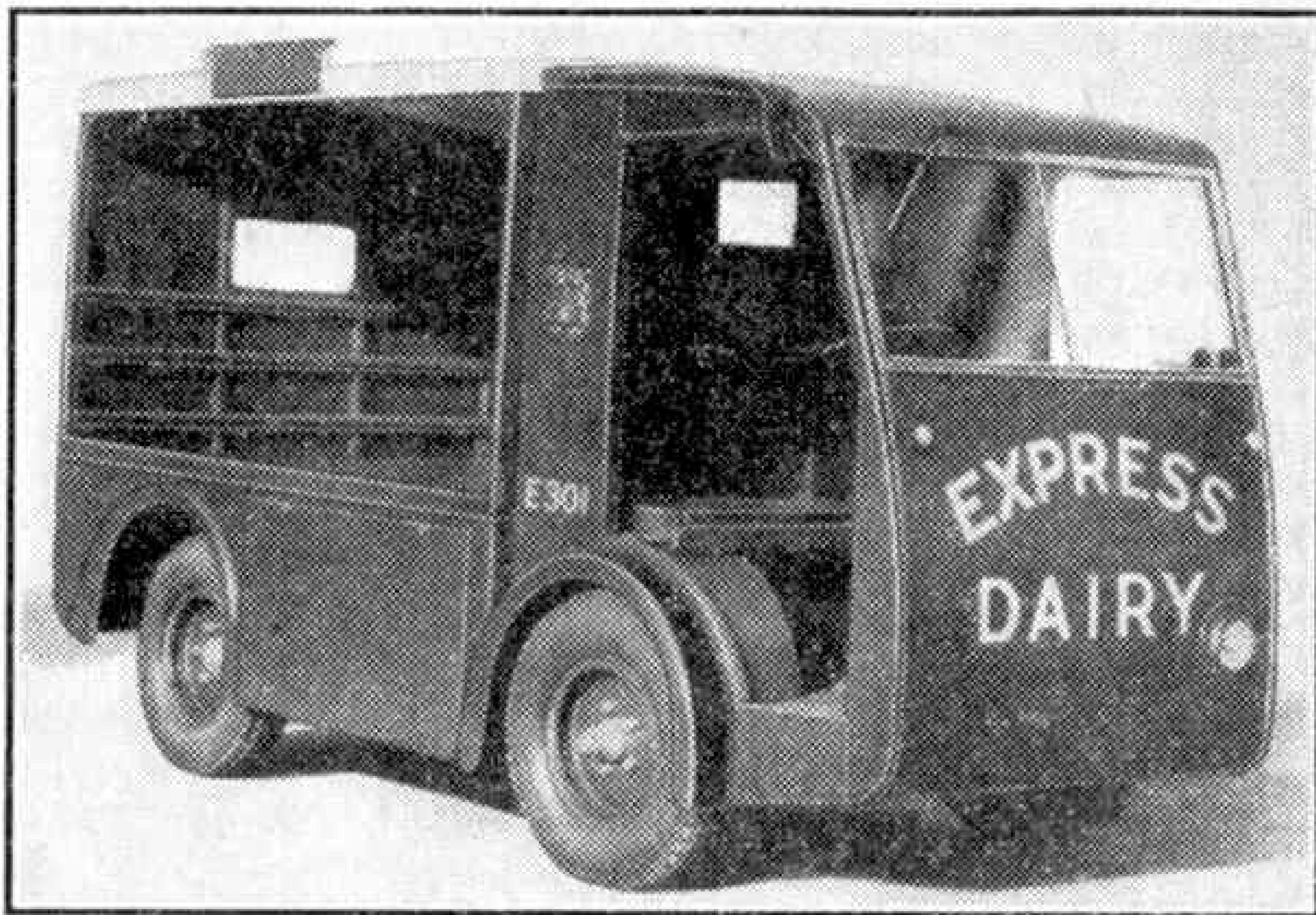
Comparisons are often made between petrol vehicles and electrics, but battery electric vehicles are not intended to run in competition with light and medium

weight petrol vans, which in their own sphere, such as rural and widely scattered areas, are most efficient. For frequent stopping and starting, however, on door-to-door delivery work over short distances in concentrated areas, the petrol vehicle is quite unsuitable, whereas its electric counterpart is the most reliable, efficient and above all the most economical form of transport available for these conditions.

There are many reasons why electric vehicles excel. They have low running and maintenance costs, and an extremely long life of up to 12 years or more compared with 5 to 6 years for a petrol vehicle. They are simple to start and drive, as there is no clutch or gear-box. Another advantage is the extreme cleanliness of both van and driver, as there are no fuel or oil problems, and no fumes to contaminate foodstuffs or to cause any offence. They are absolutely silent in operation, less fatiguing to drive, and less prone to accidents and fire risk, resulting in reduced insurance premiums. They start up instantly no matter how severe the weather, and as they are so much simpler in construction they are very reliable and trouble-free, so that less time is spent off the road for repairs.

The chassis frame, of welded steel channel section, is much like that of the petrol-engined commercial vehicle, and similar road springs, front and rear axles, steering gear, brake equipment

and propeller shaft are fitted. The rear axle employs a standard spiral bevel differential, for maximum efficiency, but an additional reduction gear is fitted to increase the motor speed and hence to

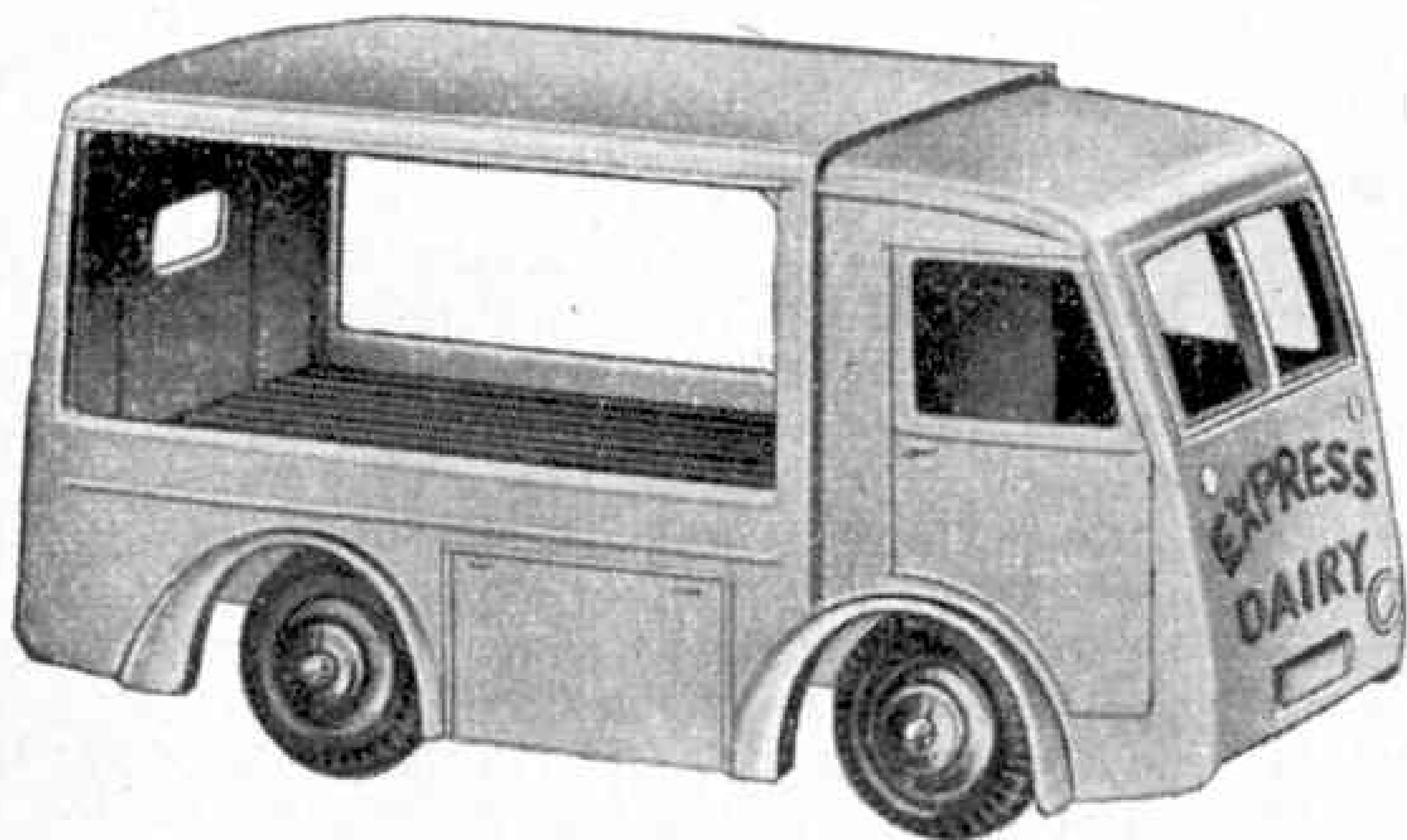


This 1-ton N.C.B. electric dairy truck is operated by the Express Dairy Co. Ltd. Photograph by courtesy of Smith's Electric Vehicles Ltd.

reduce the torque and the weight of the electric motor.

The essential difference from a petrol vehicle is the single, robust series-wound d.c. traction motor of the electric van. This motor is directly coupled to the propeller shaft in place of the engine, clutch and gear-box. It is usually located between the main chassis members at the rear of the cab, and access to it is gained beneath the driver's seat. Owing to the absence of the engine and gear-box casings and the radiator, the cab design is extremely clean and roomy, permitting easier access and egress.

The motor is driven from lead-acid batteries or accumulators, generally carried in two parts, one on each side of the chassis between the wheels. Naturally, these batteries are large, having to provide sufficient energy to drive the vehicle an average of 30 miles per day on one charge; and may be likened to cells similar to a car starter battery, all connected in series. The usual number of cells varies from 30 to 44, depending on the size of the vehicle. Each cell gives an initial voltage of two volts, and each complete battery vehicle may weigh from 12 cwt.



The Dinky Toys Electric Dairy Van, No. 30v, is a miniature of one of the range of N.C.B. electric vehicles.

The battery is a very expensive item, and accounts for the high initial cost of electric vehicles. This is rather more than for a petrol van of equivalent payload, but the big initial outlay on the purchase of a battery electric is more than offset by the longer life and lower running and maintenance charges. The battery indeed can be considered as fuel bought in advance, to be replaced only every four or five years or so. No oil to speak of is used except for lubrication of the rear axle, steering box, etc., and the only expendable fuel required is about a shilling's worth of electricity each night for re-charging the batteries.

Charging is carried out every day after the vehicle has completed the day's work, and a charging set for each vehicle is supplied for this purpose. This is mounted in the garage, generally on the wall near the position occupied by the vehicle. When the driver returns all he is required to do is to plug the lead from the charger

The bodywork is coach-built of composite timber and aluminium construction, and consequently is of a high quality and long lasting. Compared with the number of petrol vehicles on the roads today, the demand for electrics is relatively limited and they cannot be mass produced in huge quantities, nor can the same methods of construction be applied to their manufacture.

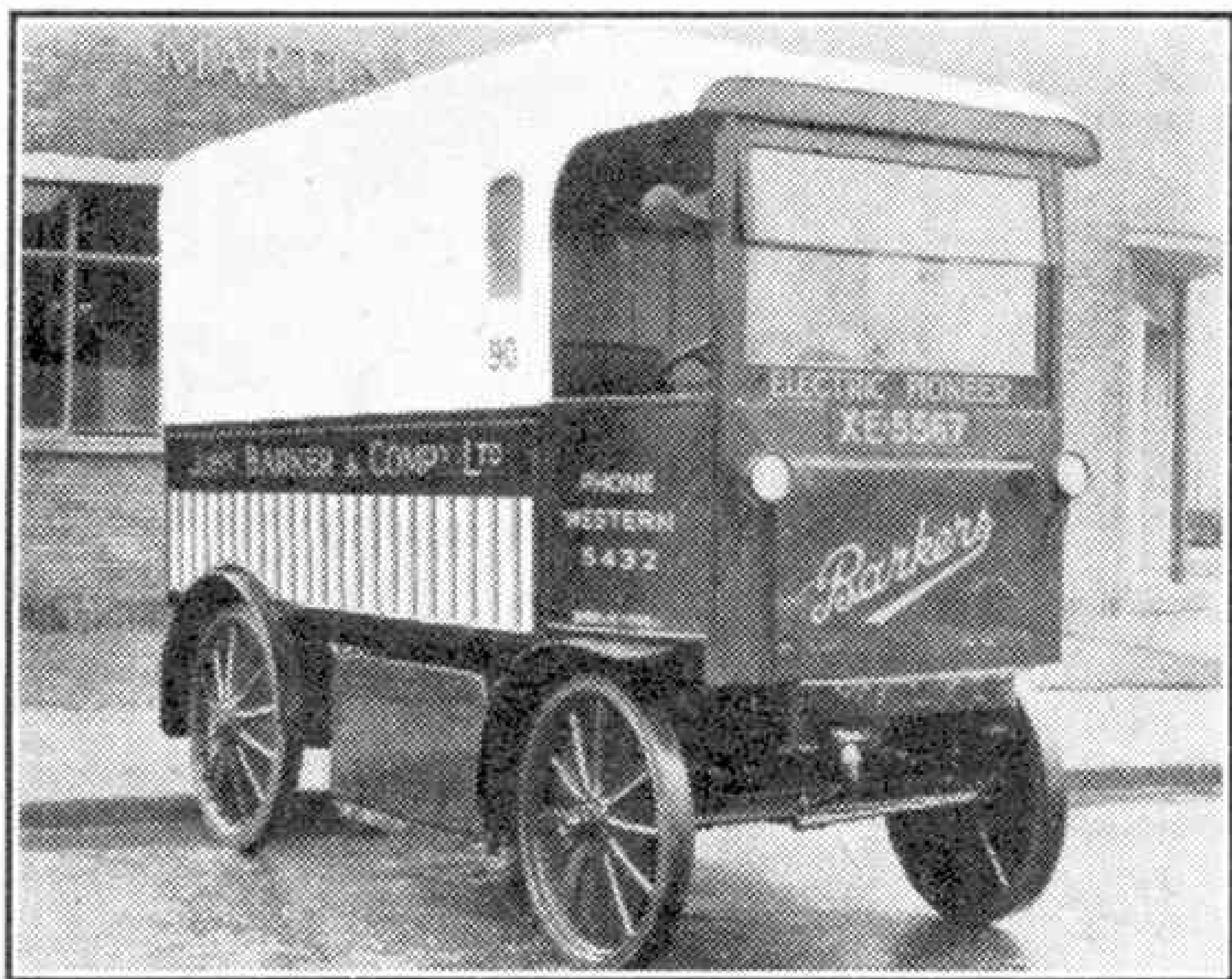
Driving an electric is simplicity itself. The only foot controls are one pedal to regulate the speed and another for the foot brake. In addition there are the normal hand brake and a main hand-operated switch that can be set to give either forward or reverse movement. When the driver has set the main switch in either forward or reverse, he has only to release the brake and press the speed control to start the vehicle. For stopping, releasing the foot pedal cuts off the motor, and the foot is then moved on to the brake pedal to stop the vehicle in the usual manner.

A starting resistance is fitted so that the battery is not connected directly across the motor when starting, but is connected through the resistance to limit the starting current. Otherwise the vehicle would move off with a terrific jerk. The resistance is gradually cut out by slowly depressing the foot pedal as the motor increases speed. Top speed is reached when all the resistance has been cut out of circuit, and full battery voltage is applied.

Most makes of electric vehicle employ this method of starting, but, unlike a tram or trolley bus with ample power available, the electric vehicle depends on the battery carried on the chassis, and every ounce of energy must be conserved. The resistance absorbs a large proportion of the power from

the battery as the vehicle picks up speed, and for this reason, in place of the more usual straight series control, as it is termed, the "NCB Electric" employs a more efficient method called "parallel series" two speed battery control, which has been proved to save 25 per cent. of the battery capacity.

In this control, the two sections of the battery are connected in parallel when the driver depresses the foot pedal, giving half voltage on the motor, (Cont. on p. 334)



A pioneer electric battery truck, made in the United States in 1916 and still in working order. Some of these trucks have only recently been withdrawn from service and replaced by N.C.B. 1-ton parcel vans. Photograph by courtesy of Smith's Electric Vehicles Ltd.

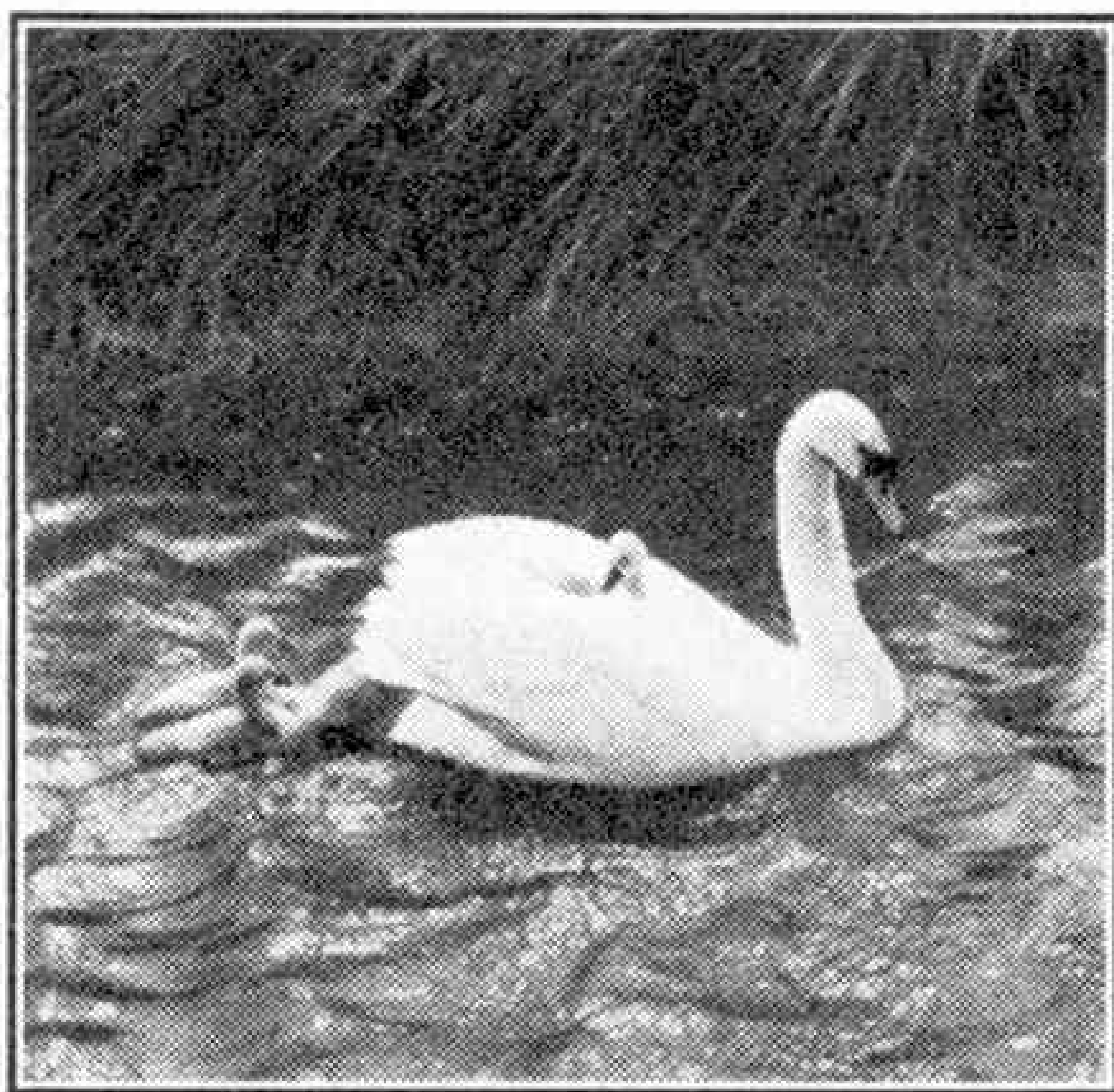
into the socket provided on the vehicle and to switch on the charger. The charger is automatically switched off when the battery is fully charged again, and in the morning the driver merely pulls out the plug. The vehicle is then ready to drive away. Just in case he forgets to disconnect the charger, it is usual to interlock the charging socket, so that while the plug is in the vehicle cannot be driven away. This prevents efforts to pull the charger off the wall!

Photography

Competitions

By E. E. Steele

COMPETITIONS afford the amateur a chance to try his work against that of others with the added thrill of pulling off a prize, which is a very great incentive to improve one's work. Some competitions are run the whole year round, such as those in the "M.M." the "Amateur Photographer" and "The Field." July, however, is usually the month when the big newspapers open their summer competitions, with large and varied prizes for photographs of all subjects. As the competitions are run for several weeks the snapshotter is given a chance to take some subject which he may think suitable, and some



"Come on boys, there's plenty of room!"

newspapers insist on recent work being submitted.

There are a few subjects which are always popular with the general public, and consequently with editors. Of these animals and children are predominant and are available everywhere, so the amateur need not look far for his subjects. It is what he does with the chosen subject that makes all the difference between success and failure. It is well to know why some snaps are failures, and a fruitful cause is wrong choice of background. Many click the shutter and later find their attractive portrait all mixed up with spotty bits of buildings and windows that were never even noticed when the exposure was made. Choose a nice subdued background of an even tone to contrast with the subject. The latter will then stand out from the background instead of being lost in it. Look in the daily newspapers and note how the professional photographers make the important subject matter stand out from the uninteresting background. If your camera has a lens with large aperture, using it without stopping down will throw the background out of focus, but be sure that the main subject is sharply focused, for competition editors have no use for fuzzy prints.

Some of the finest work in the photographic exhibitions shows the utmost simplicity, so don't try to crowd too much into your

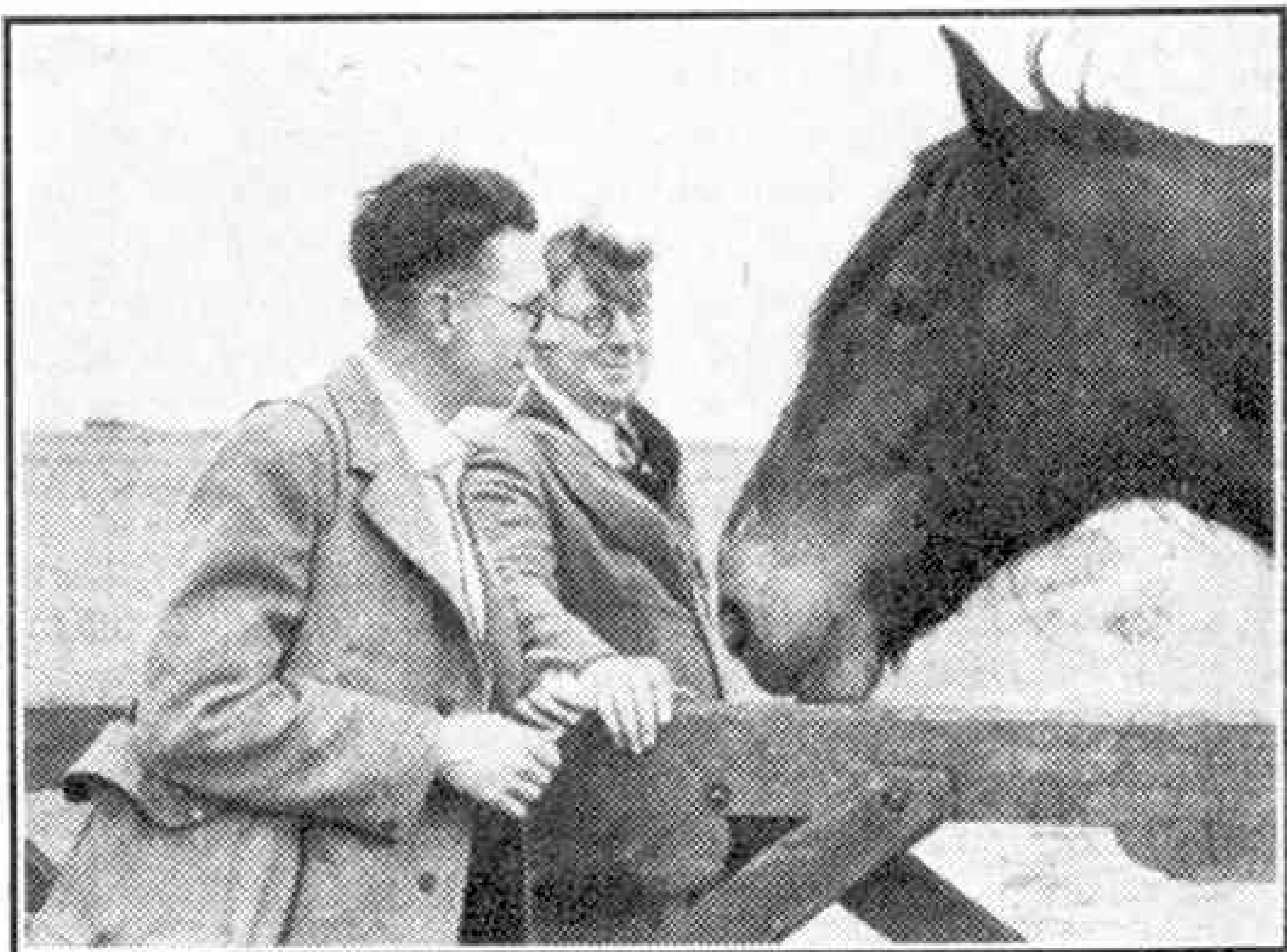


Peacock Butterfly on rose. The illustrations to this article are by the author.

negative, it is all so distracting. An artist paints just what he requires in his picture. A photographer can't do that, but by wise choice of viewpoint he can eliminate much of what is not required. It is quite easy to do this by moving around the subject and carefully examining it in the viewfinder at the same time. As this can be seldom done with animals it is best to try and coax the victim into a previously arranged position where conditions are right. This is easy enough with one's family pets.

Having made your best print, read the rules, carefully pack print between cardboard, including your address and postage for return of print when the competition is over.

Study prize-winning prints.



Making friends.

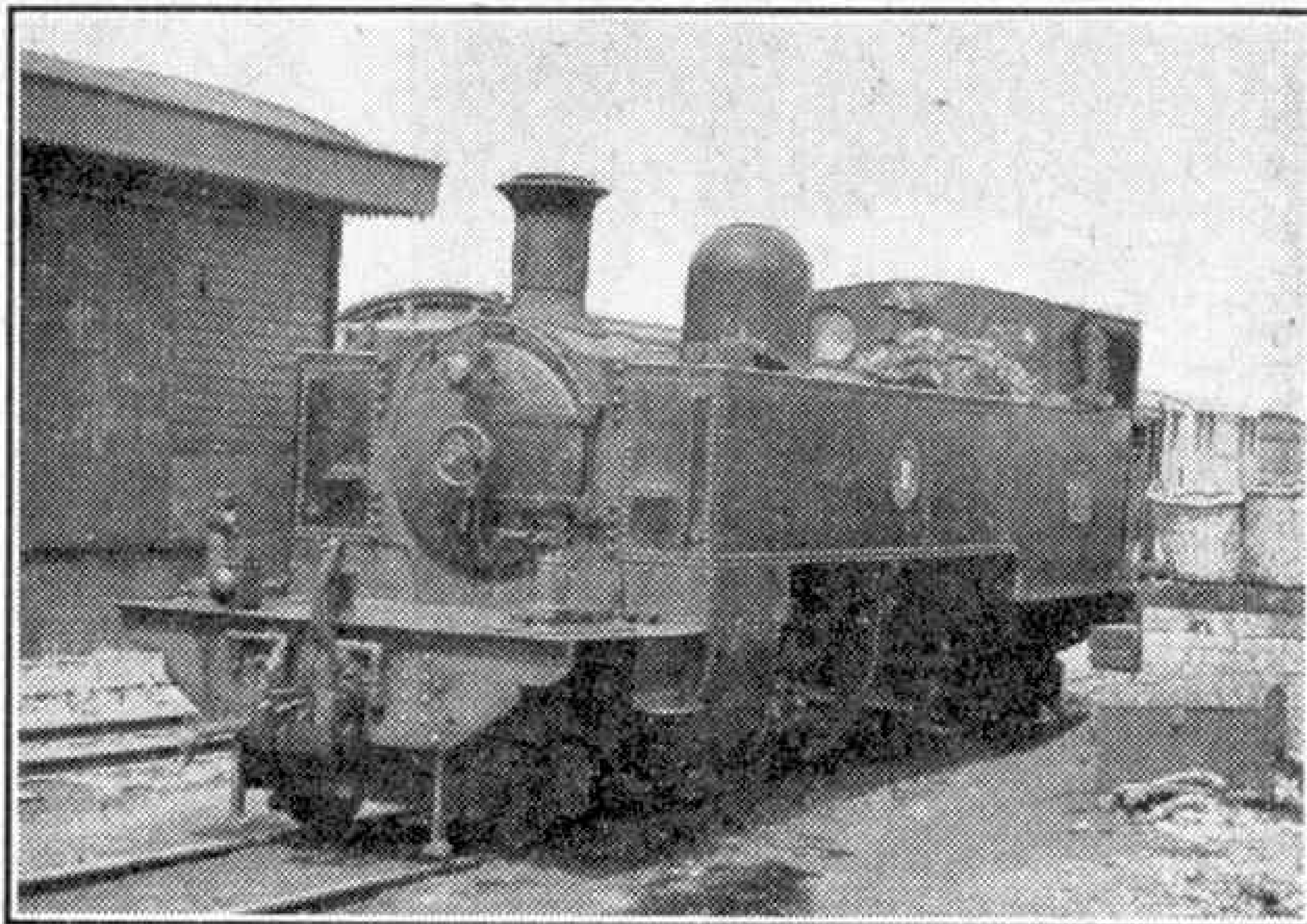
County Antrim's Last Narrow Gauge Line

By E. M. Patterson

BALLYCASTLE, on the north coast of County Antrim, Northern Ireland, is a prosperous little market town with a large summer tourist population. Prior to 1880 the nearest railway station was 16 miles away at Ballymoney, on the then Belfast and Northern Counties Railway main line between Belfast and Londonderry. The Ballycastle Railway was incorporated on 22nd July 1878, the line was opened on 18th October 1880 and, in common with other Irish narrow-gauge lines, a gauge of 3 ft. was adopted. At the time, the construction of the electric tramway from Portrush to Bushmills, described in the "M.M." of April 1950, was projected and it was then intended to connect it with the Ballycastle line by a light railway between Bushmills and Dervock. This connection was never built and the Ballycastle railway system remained unconnected with any of the other 3 ft. gauge lines in County Antrim.

From 1880 to 1924 the Ballycastle Railway was operated independently. Some five years after the end of World War I the company's finances were in a very unsatisfactory state, and on 8th February 1924 an extraordinary general meeting was held to consider the closing of the line; this took place on 4th April 1924. After a four months' interregnum the line came to life again, though no longer as a separate concern. Operation was taken over by the N.C.C. section of the L.M.S., the latter having assumed, on grouping, the interests of the former Midland Railway, which in 1903 had taken over the old Belfast and Northern Counties lines, both standard gauge and narrow gauge. To quote from a circular from the Manager's Office, the Ballycastle line was "re-opened on Monday 11th August, 1924, for Passenger, Parcels, Goods, Mineral and Live Stock Traffic." Dervock and Armoy were "to be worked as attended halts, and Stranocum, Gracehill and Capecastle unattended."

From this time the history of the line, especially as regards locomotives and rolling stock, became interconnected with the other narrow-gauge lines then under N.C.C. control. These were respectively the line from Ballymena to Parkmore and Retreat, originally the Ballymena, Cushendall and Red Bay Railway, the first narrow-gauge railway in Ireland; and the old Ballymena and Larne Railway line. The fortunes of both these lines were declining and passenger working on them ceased in the early 1930s. The Ballycastle line continued to operate, but competition from road transport became progressively more acute until finally,



Engine No. 44 of Class "S" at the coaling stage at Ballymoney. Note the coal baskets on the raised platform.

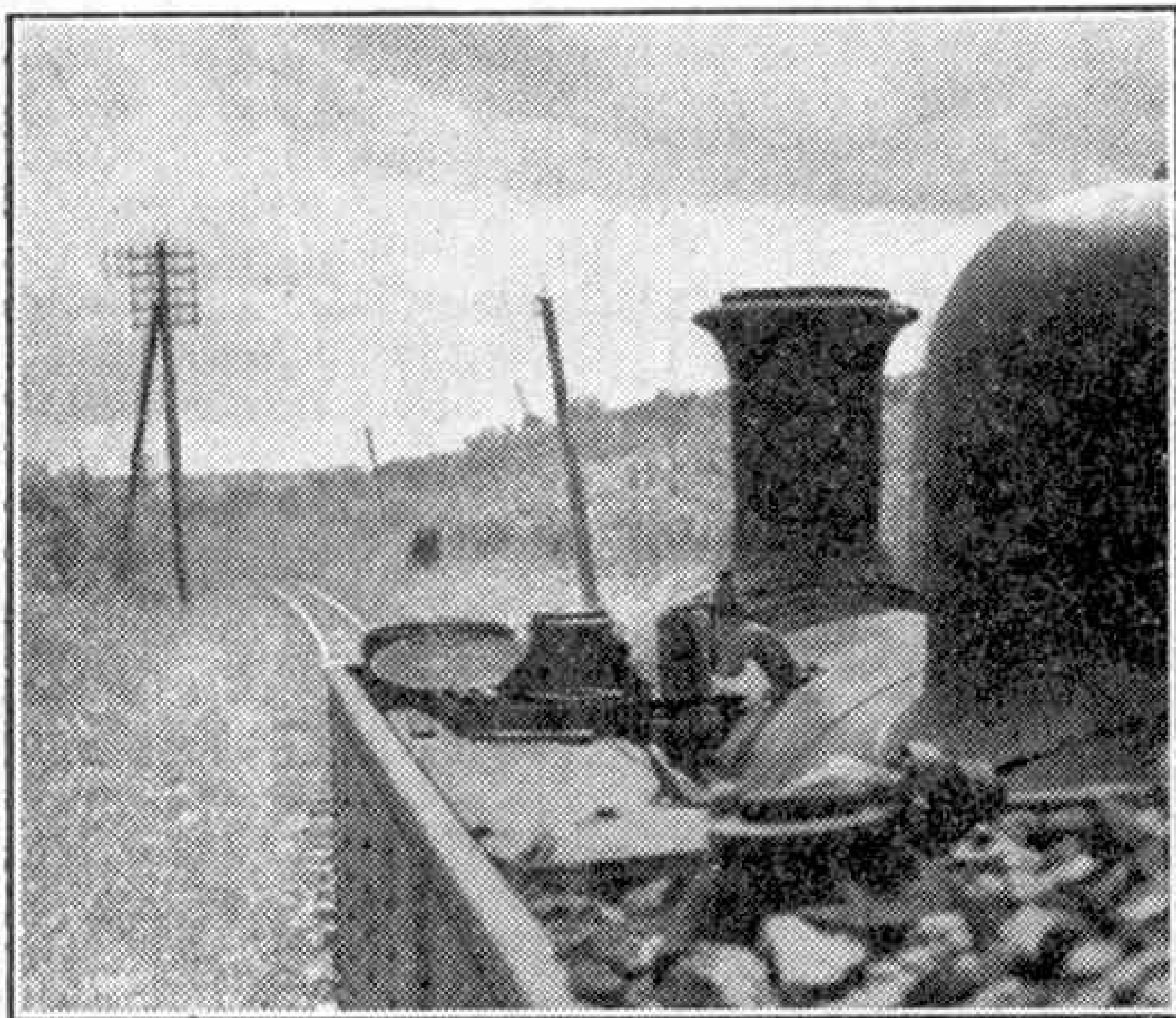
five years after the end of World War II, the line closed for the second and very probably the last time.

As to locomotives, the Ballycastle Railway used five. Three of these were 0-6-0 saddle tanks, built by Black, Hawthorn and Co. in 1879 and named respectively, "*Dalriada*," "*Countess of Antrim*" and "*Lady Boyd*." In 1908 the company purchased two massive 4-4-2 side tank engines, Kitson-built in Leeds, which were numbered 3 and 4, one of them immediately replacing "*Lady Boyd*."

On the re-opening of the line by the N.C.C. in 1924, the two remaining old saddle tanks followed "*Lady Boyd*" to the scrap heap; and the two Kitson 4-4-2

side tanks, renumbered 113 and 114, were transferred to the Larne road for the boat expresses. Engines in use on other parts of the N.C.C. system then made their

years No. 42 handled occasional goods trains on the remaining Larne-Ballyclare portion of the old Ballymena and Larne Railway.



The view ahead from the footplate of No. 44 showing the characteristic lineside.

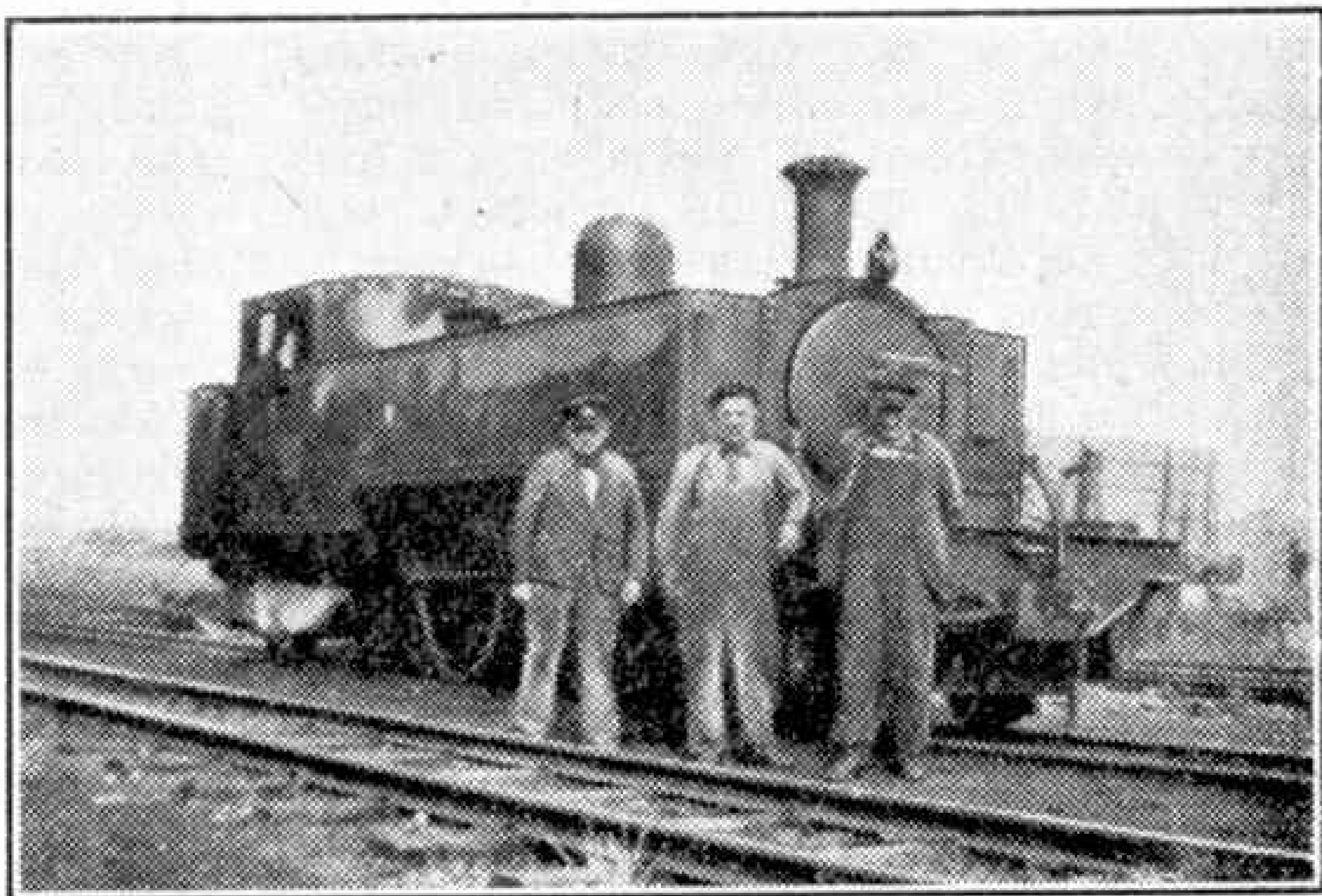
appearance on the Ballycastle line. Among them were the Beyer-Peacock 0-6-0 side tanks Nos. 106 and 108, graceful high-domed outside-cylinder engines which had been built in 1887 for the Ballymena and Larne Railway.

A more interesting class of engine, some of which were transferred to the Ballycastle line, had been designed by Mr. Malcolm of the old Belfast and Northern Counties Railway. These were the class "S" 2-4-2 two-cylinder compound tanks, which had the outside high-pressure cylinder on the left and the outside low-pressure cylinder on the right-hand side of the engine. Six of these were built initially for use between Ballymena and Larne, at various dates from 1892 to 1920. As designed they had very little bunker capacity, with only a small amount of coal carried on each side of the fire-box aft of the water tanks. Some engines were rebuilt to Classes "S1" and "S2." Thus Nos. 101 and 102 were given rear bunkers, becoming class "S1" in 1930 and 1928, and they were renumbered 41 and 42 in 1939-40. In this form No. 41 worked the Ballycastle line until its close, while in recent

One of the 1892-built compounds, originally No. 69, was renumbered 110 in 1899 and was extensively rebuilt to Class "S2" in 1931. In this form it had a larger boiler, a rear bunker, and a rear bogie in place of the pony truck, this giving it the unique wheel arrangement of 2-4-4. This engine ran for a time on the Ballycastle road, but later worked the Larne-Ballyclare line.

During its last four years, the Ballycastle line was worked by two locomotives of Class "S," Nos. 43 and 44, and No. 41 of Class "S1," on the principle of one engine in steam, except when occasional banking was required out of Ballycastle, or on Lammas Fair Day.

One or two incidents mark the last chapters of the story. In January 1943, a train of two carriages, 10 wagons and a brake van, headed by No. 41 got out of control at the head of the 1 in 60/50 bank between Capecastle and Ballycastle. A 15 m.p.h. slack round the curves at Ballylig was swung through in gay abandon at more than twice the limit, and an estimated speed of 60 m.p.h. was reached on the long downhill straight beyond. A curve over a stone-built viaduct entering Ballycastle was fortunately negotiated safely, but the engine clambered over the solitary buffer stop at the terminus, crossed the road and ended bunker-down



Engine No. 41, one of the two rebuilt as Class "S1" with external bunkers. Photograph by Mr. J. W. McNaul, Belfast.

in a stream. The sole casualty was the fireman, who jumped for it on the way through the terminus and sprained his ankle; but Driver McKissick was reported as unwilling to undergo such an experience again!

A less spectacular exit from the wrong end of Ballycastle station was provided by No. 44 on a snowy day in January 1949, when the buffer stop was again demolished

of rain, and a trickle of steam from the injector, photography had to be temporarily abandoned.

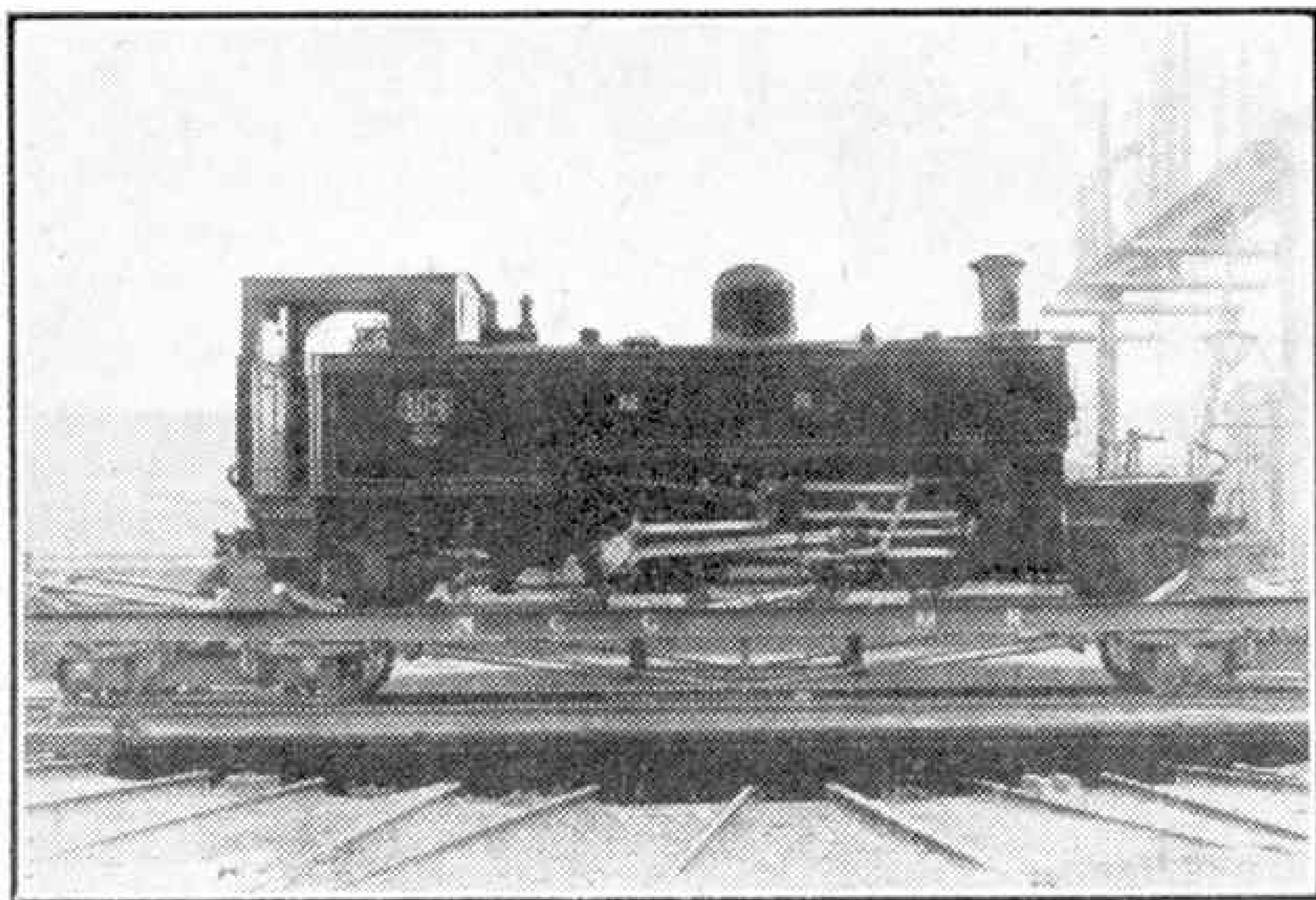
Much of the line was across flat, high-level peat bogs, and the distant views of the blue hills of Antrim and the reek of turf smoke from the whitewashed farms left impressions that no camera could capture. Permanent way upkeep had been cut to the minimum and many of

the sleepers under the flat-bottomed rails were rotting and breaking away. As a result, a large yellow and black notice near Stranocum warned us to "*Reduce Speed to 5 miles per hour*" for over a mile, and with this long slack and two others of 15 m.p.h. the 16½ mile run took 50 minutes. The boiler pressure fluctuated between 130 and 160 lb., but with a generous time allowance only the ascent of the Capecastle bank called for steady work by Jack Duff.

During the last week, each day saw the line sinking fast. Metal posters were taken down and consigned to Belfast, and lamps, sign boards,

waiting room furniture and luggage trucks were labelled as for an auction. A chance visit to one halt found the porter preparing for a bonfire of accumulated papers, and two working timetables, dated 1933 and 1934 respectively, were triumphantly salvaged. The former showed the daily 2 p.m. goods ex Ballymena and Larne, but by 1934 the ominous "Goods trains run on this line as Traffic demands" covered both these routes, though over the year traffic on the Ballycastle railway had increased from two to five passenger trains each way on week-days.

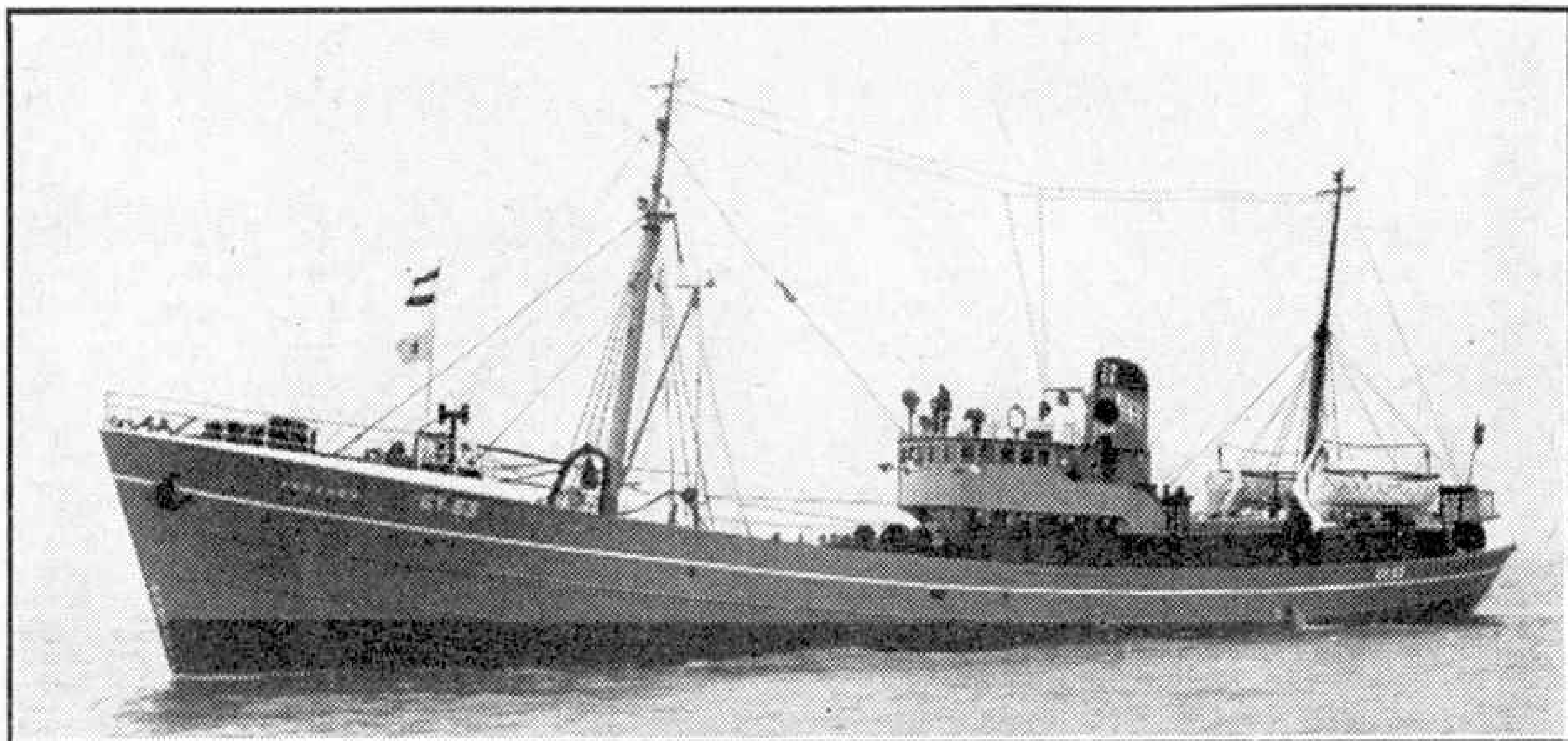
On Sunday evening 2nd July 1950 the last train ran from Ballycastle to Ballymoney. For the occasion, No. 44 with Driver Limerick was piloted by No. 41 with Driver McKissick, both locomotives looking very smart in their new black Ulster Transport livery, the leading engine bravely decorated with paper streamers and flags. Four carriages and two brake vans made up the train and Ballymoney was reached at 7.20 p.m. The last passenger working over the line left Ballymoney at 8.50 p.m.



M.R. (N.C.C.) No. 104 of 1920, the last of the two-cylinder compound class to be built. It is mounted on a standard gauge wagon used for transporting the narrow gauge engines to and from Belfast for repairs. British Railways Official Photograph.

and the guy-rope of a telegraph pole near by stretched tight as a banjo string. On 12th March 1947 the last train out of Ballycastle had to fight its way through a severe snowstorm, and at mile-post 11½ engine No. 41 plunged its boiler into a deep drift which blocked a cutting. The passengers spent the night in the train, most of the time without steam heating when the limited coal and water supply was exhausted, and after a rescue party had dug them out, reached their point of departure a day after leaving it.

The writer was fortunate to be on holiday near Ballycastle during the last week of life of the line and made two footplate trips on No. 44. Compared with a main-line engine, the cab was far from roomy, but nevertheless he was made very welcome by Driver Barry Limerick and Fireman Jack Duff. On one journey two passengers were in the cab and conditions became decidedly congested, for not only was there twice the normal population on board but a quarter-ton of coal occupied much of the floor space. With curtains across to keep out a drizzle



Photograph by courtesy of Cochrane and Sons, Selby.

A Modern Steam Trawler

THE handsome vessel shown in the illustration at the head of this page is the steam trawler "*Andanes*." She was built by Cochrane and Sons, Selby, for the Rinovia Steam Fishing Company, Grimsby, and is an outstanding vessel of her class, designed to provide the finest fishing qualities and incorporating equipment that has never previously been fitted in ships of this class.

The "*Andanes*" is of modern design, and with her cruiser stern, plate stem and a certain amount of streamlining has a very attractive appearance. Her length overall is 198 ft. 6 in. and her breadth 31 ft. Her gross tonnage is 724 and on her trials she attained a speed of 14 knots. The vessel has excellent sea-going qualities and a large capacity for both fuel oil and fish. A considerable amount of welding was used in her construction.

The navigating equipment of the "*Andanes*" is probably more up-to-date than that of any other trawler afloat. The Sperry gyro compass fitted operates long periods without attention and a Sperry single unit gyro pilot has been fitted to provide automatic steering when required. The "*Andanes*" is the first British trawler to be equipped with this type of gyro pilot. Kelvin and Hughes marine radar equipment also is installed, with two echo sounders, one of which is recording.

The vessel is driven by a triple expansion steam engine. The boiler has three furnaces, burning oil fuel on the Wallsend-

Howden forced draught system, and provides superheated steam at a pressure of 225 lb. per sq. in. and a temperature of 600 deg. F. Two 15 kW generators are installed, one driven by steam and the other by a diesel engine, with a 6 kW standby set, to provide power and lighting facilities, which include a floodlighting system and a 20 in. searchlight.

The latest type of fishing gear is installed throughout. The fishroom is lined with wood and well insulated, and the cooling plant keeps it at a steady temperature of 32-33 deg. F. This plant starts automatically, and distant thermometers recording the temperature are fitted in the wheelhouse, so that a close watch can be kept on conditions in the fishroom. An installation for boiling cod livers and extracting and storing the oil also is provided.

The comfortable quarters for officers and crew are worthy of special notice. The captain's accommodation and wireless room, with the operator's cabin, are amidships, and officers and firemen are housed aft. Below the main deck forward there are three compartments for the crew, arranged as nearly as possible to give single berth cabin accommodation. A Marconi Oceanic sound reproducing installation is fitted for relaying news and entertainment, together with a gramophone turntable unit and a wire recorder for use in recording interesting news for later reproduction.

"Forewarned is Forearmed"★

By John W. R. Taylor

AT five minutes past four on the morning of 13th June 1944, two members of the Royal Observer Corps on duty at Dymchurch in Kent heard a strange aircraft approaching their Post from the sea. It had been a bad night; the neighbouring town of Folkestone had been shelled by German guns on the Pas de Calais coast and a Messerschmitt 410 fighter had put in a brief, unpleasant appearance before being shot down near Barking. The two men might well have been excused for feeling a bit sleepy, less alert than usual; but the Observer Corps had not relaxed its watch over these islands for one second since the outbreak of war, and this was no exception.

As the aircraft came in closer they heard the raucous intermittent beat of its motor, saw a trail of flame and a rectangular black shape silhouetted for a moment against the dark sky. Recognising its shape at once, they quickly plotted its course and shouted the code word "Diver" into their telephone. A few minutes later, the aircraft crashed and blew up at Swanscombe, near Gravesend. The first Flying Bomb had arrived.

In the months that followed, the code word "Diver" became all too familiar as 7,488 Flying Bombs crossed the coastline of Southern England, each with its half-ton of explosive for London and other cities. On hilltops, church towers, telephone exchanges, in open fields and from scores of other look-outs all over the Southern Counties, men and women of the R.O.C. plotted their tracks, directing the fighters and guns which between them destroyed 3,725 of Hitler's robot raiders.

As they did so, many of them must have recalled a summer four years earlier when the skies were filled with other, more deadly enemies—living ones, in aircraft

that could hit back at our defences. The Observer Corps was not "Royal" then, for His Majesty the King granted the Corps that title in recognition of its work during the Battle of Britain. It was, in fact, due in no small measure to the efficiency of the Corps in directing the fire of Fighter and Anti-Aircraft Commands that the enemy had been forced to switch to less reliable, automatic reprisal weapons like V.1 and V.2.

A few older members could look back

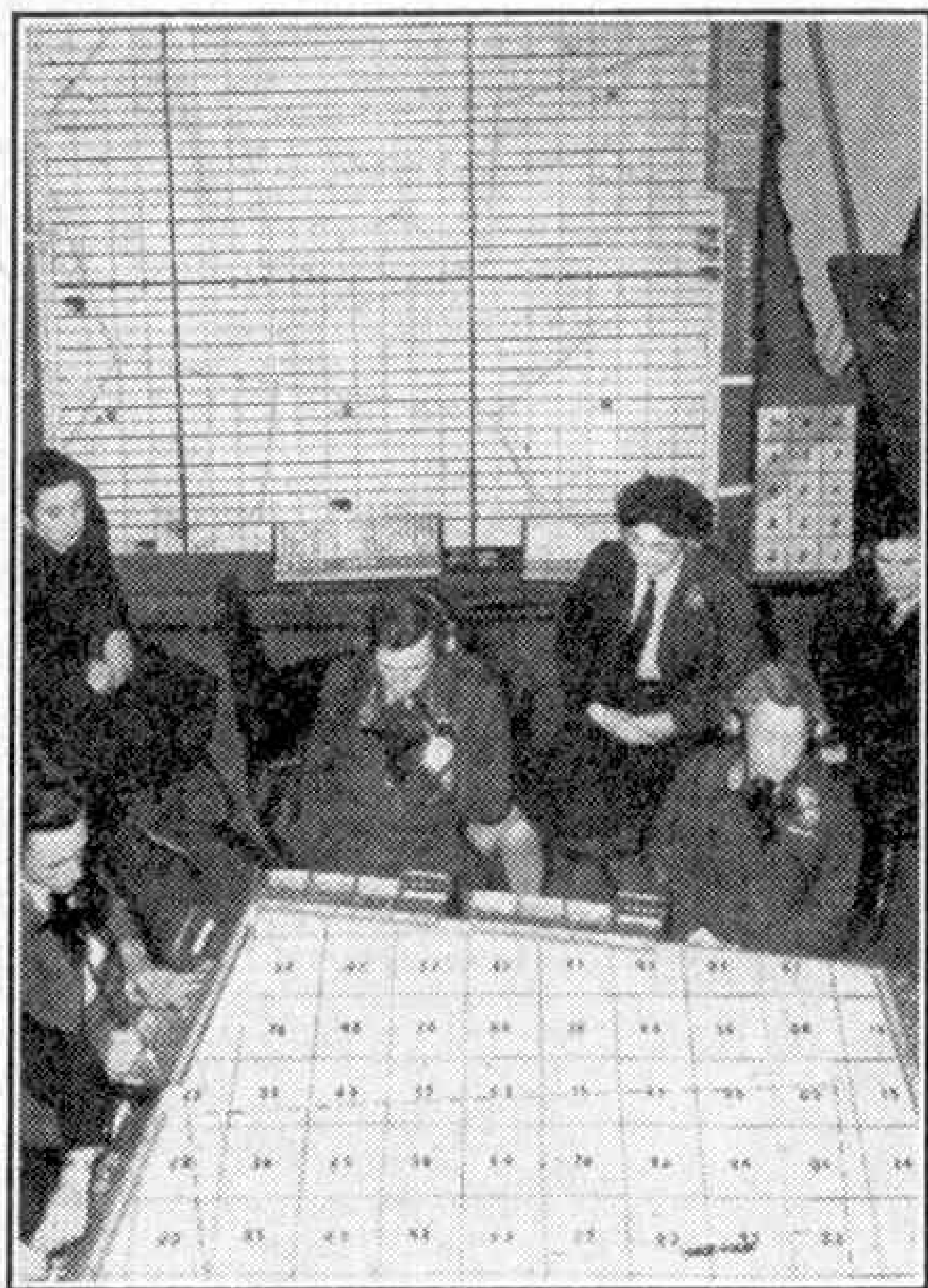


Typical Royal Observer Corps Post, showing Head Observer plotting the invading aircraft's position with the aid of the Post instrument. The Observer on the left is telephoning the result to the "Centre," and the one on the right is scanning and identifying the aircraft. Illustration by courtesy of Brenard Photos, Heath Row.

even further to when the "Air Bandit System" had been set up in 1915 to keep track of raiding Zeppelins. It was a modest beginning, with two roughly parallel lines of observer posts running from the Channel to the Tweed, about 20 miles from the coast and 10 miles apart in each direction. They were manned by volunteers who were able to put through priority telephone calls to the War Office to report Zeppelin sightings.

By the end of the 1914-18 War it was obvious that no scheme of air defence could function properly without an effective raid reporting organisation, but it was not until Air Defence of Great Britain was instituted in 1924 that the

*The motto of the Royal Observer Corps.



Main Table Plotters at "Centre," No. 17 Group, Watford. Reports from Posts are recorded as individual "raids" on this table, and then passed on to Fighter Operations Room.

Air Ministry, Home Office and Post Office got together to form one. The first two Observer Corps Groups, covering Kent and Sussex, were created in the following year, in time to prove their worth in the annual R.A.F. exercises. Two further Groups were formed in 1926, but it was not until 1933 that the Corps began to expand into the vast network of interconnected Posts and Centres which covered most of Great Britain by the outbreak of the second World War in 1939.

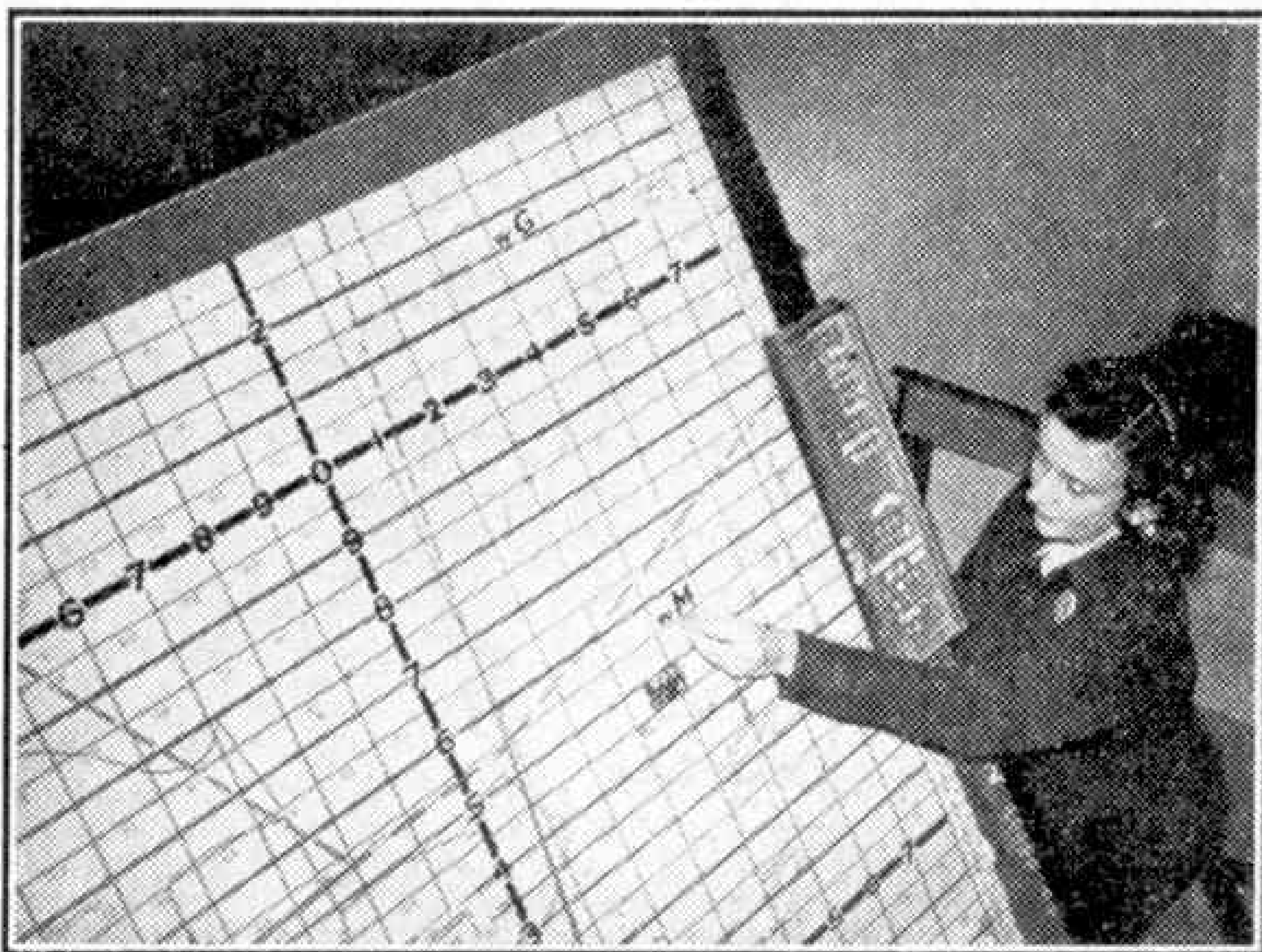
Even then its equipment was primitive, being similar to that evolved at the end of the 1914-18 War, but which had never been put to practical use. It consisted basically of a circular map table on a tripod, surmounted by a strange-looking contraption of swivelling bars which was christened somewhat optimistically the "height finder." Together with a field telephone set, a little brown Book of Instructions and a

lot of enthusiasm, that was the total equipment possessed by each Observer Corps Post.

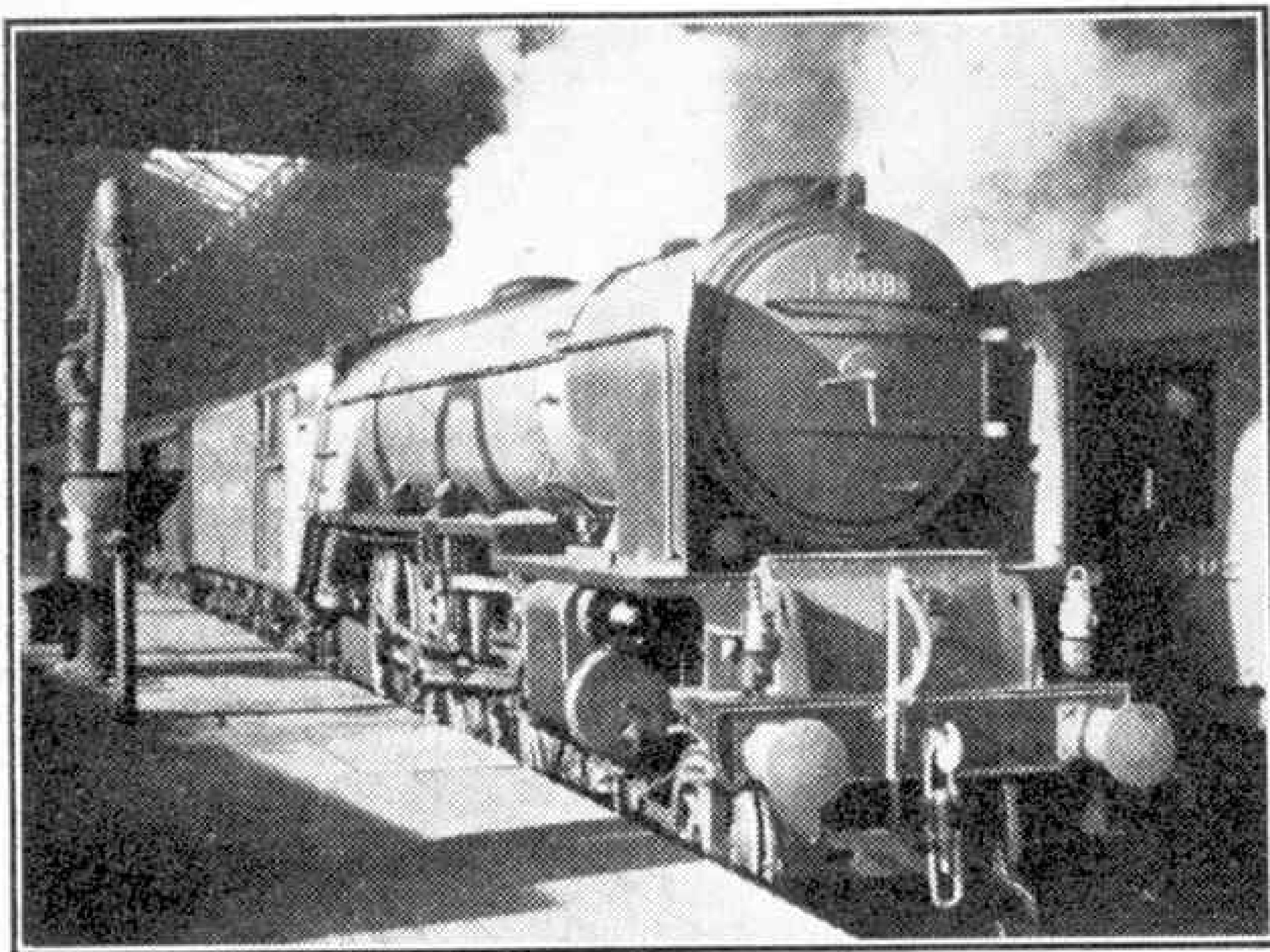
The whole organisation came under the operational control of the Air Ministry in 1929, but the Home Office still administered it, and all observers were enrolled as Special Constables. On the outbreak of war, however, the Air Ministry also took over administration, and the present R.O.C. is part and parcel of R.A.F. Fighter Command, although it retains its own Commandant.

During the war, membership of the Corps rose to 32,000 including 4,300 women, who were welcomed after June 1941, and this volunteer force manned the entire home defence system of 1,420 Posts and Centre operations rooms. For 5½ years every aircraft that flew over Britain was identified and tracked by the Posts and reported by telephone to their particular group Centre, where its position was plotted on a large map covering the whole area of country visible from the Posts in that particular Group. Plotters at Centre then passed the information on to Fighter Command Operations Rooms, where it was used to call into action our fighter and anti-aircraft defences.

Nor was that the limit of the Corps' duties, for it also controlled the sounding of air raid warnings at towns in the path of hostile aircraft, and worked the last-minute "danger imminent" warning system which saved millions of precious man-hours by enabling work to continue as long as possible (Continued on page 334)



Woman Observer recording an incoming "raid" on the long-range board, on which aircraft can be plotted before they actually enter the particular Group of Posts covered by this Centre.



An L.N.E.R. type "A1" Pacific" No. 60138 on a York train at Leeds Central Station. Photograph by L. E. Chadderton, York.

Railway Notes

By R. A. H. Weight

Long Runs without Water Pick-up

"The Railway Gazette" points out that the 112.5 mile runs in each direction made by the "Enterprise" expresses of the Great Northern Railway (Ireland) between Dublin and Belfast, referred to in last month's "M.M.," are the longest non-stop journeys regularly booked in Great Britain or Ireland without any facilities for replenishing the locomotive water supplies from track troughs. They are the more notable in that the tender tank capacity of the engines used is 3,500 or 4,000 gallons according to type. Coras Iompair Eireann also run the Belfast-Cork "Enterprise" non-stop over the 110.6 miles between Dublin (Amiens Street) and Limerick Junction both ways without stopping, with 4,000 gallon tenders.

In England the 107.9 miles of the pre-war "Bournemouth Limited" of the Southern Railway, also with 4,000 gallon tenders on the "Schools" 4-4-0 locomotives usually used, has been the extreme limit in recent years, though in the days of fierce competition between the East and West Coast Routes, the former Caledonian often, in summer, ran the 150.8 miles from Carlisle over Beattock and Gleneagles summits to Perth, without a stop and without water-troughs.

Regular pre-war non-stop runs with steam on the mainland of Europe, between Paris and Liège, Nancy, Brussels and Calais, 226.7, 219.1, 193.1, and 184.1 miles in length respectively, involved the somewhat uneconomic haulage of high-capacity tenders to provide sufficient water. The Paris-Calais runs have been revived since the war.

London Midland News

"Royal Scot" class engines are not regularly seen south of Leeds on the Midland Division. Some time ago No. 46120 "Royal Inniskilling Fusilier," rebuilt with the new type boiler, was on loan to Derby Shed, and her performance was logged during a run part of the way on the afternoon Newcastle-Bristol express. With an 11-coach train, weighing about 370 tons, a good start was made out of Chesterfield, speed rising

to 50 m.p.h. on the gently rising grades to Clay Cross, followed by 46-48 m.p.h. on to Stretton. Downhill through Wingfield 70 m.p.h. was easily attained before a very cautious passage of Ambergate junctions. On reaching the Manchester main line there was an acceleration to 73 near Duffield, leading to a gentle run into Derby, where on arrival two minutes had been gained over a road that is far from easy. The large locomotive attracted a good deal of interest.

"Jubilee" 4-6-0 No. 45700 has been noted in service without her name "Britannia"; the plates presumably have been removed on the advent of 4-6-2 No. 70000, now carrying that name. As the two engines are hardly likely to work in the same area, and there are already one or two instances of duplicated names on British Railways, the action taken seems rather a pity.

Diesel-electric main line locomotive No. 10001 recently received general overhaul at Derby Works. Meanwhile No. 10000 was engaged in express or semi-fast passenger working

on the Midland Division.

At Derby Works 4-6-0s of the standard class "5" type numbered 73001 upward are under construction, and at the time of writing W.R. 0-6-0 pannier tanks and E.R. "J39" 0-6-0s are under repair. There, and at Crewe, former L.T. and S. 4-4-2Ts were being scrapped. Building of "Britannia" class "Pacifics" goes on at Crewe. For running-in purposes they make journeys to Manchester or Shrewsbury and back, sometimes on regular passenger trains.

The long-standing overhead electric local service between Lancaster, Morecambe and Heysham was discontinued in January last owing to the need for repair and renewal of equipment, should this be decided upon. In replacement, steam push-and-pull services have been worked by 0-4-4Ts of the "2P" series, numbered 419xx, and built by the L.M.S. in 1932-3. Two of the surviving Webb L.N.W.R. motor-fitted 2-4-2Ts, one No. 6683 lettered L.M.S. and the other with British Railways number 46749, were recently noted at Warwick, and also at Coventry on Saturdays.

The massive looking L. and Y. 0-8-0 mineral engines were once very familiar in the north-west, but only three now remain. These belong to the last superheated series, classed "7F," and are numbered 52857, 52870, 52945.

Summer Train Services

By the time these notes appear in print British Railways summer train services will be coming into full operation. Many additional expresses, together with accelerated timings, were planned to commence on 18th June, with others beginning in July to cater for the peak holiday period. More cross country trains are running to coastal resorts at week-ends from the Midlands and North, which avoid the necessity for passengers to change on the way.

Quickened long distance expresses include the "Royal Scot"; the "Flying Scotsman"; "Capitals Limited," making the non-stop run between London and Edinburgh in 7hr. 20 min.; the "Queen of Scots"; and the new 8.40 a.m. Paddington-Swansea express, first stop Cardiff on ordinary weekdays. Several trains between Euston and Birmingham, serving Coventry and Wolverhampton, and others between Liverpool Street and Clacton-on-Sea, Norwich and Cromer also are speeded up.

Development of the standard departure time

arrangement provides for fast trains from Birmingham to Euston to leave at 30 min. past the hour; from Euston to Liverpool at 30 min. past and to Manchester at 45 min. past; from Manchester to St. Pancras at the hour; from Liverpool Street to Norwich at 30 min. past; and from Norwich to London at 45 min. past.

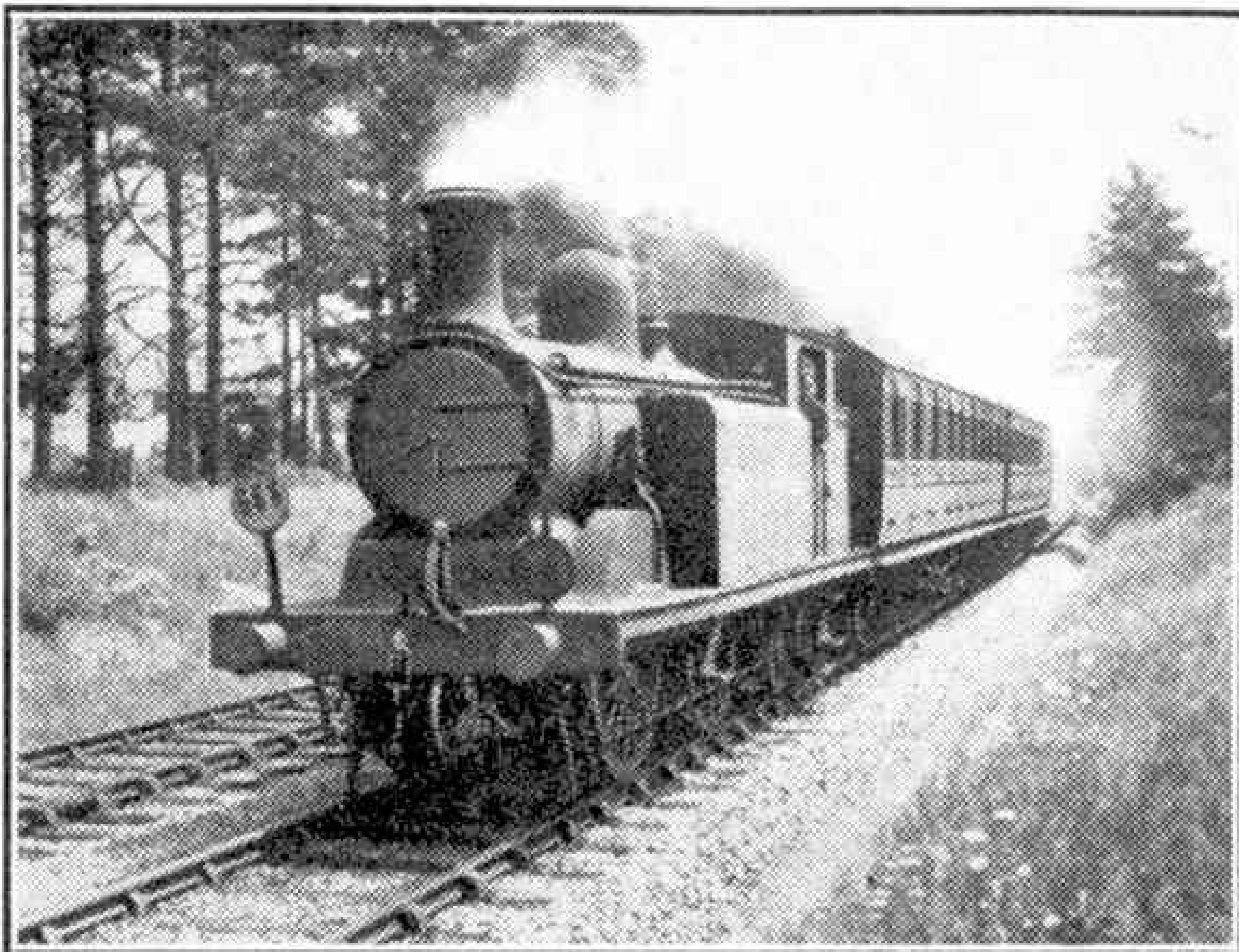
There are many long runs without booked stop. The arrangement for certain main line trains to call at suburban or residential stations on the outskirts of London, Birmingham, Manchester, Liverpool, etc., in order to provide more direct journeys, has proved popular and has been extended.

Train names that have not been seen since 1939 have reappeared. They include such names as "*The Manxman*," daily from Euston to Liverpool and back; and "*The Bristolian*," daily from Paddington to Bristol and back. Details were given in a previous issue of the named trains composed of new standard coaches which were inaugurated in May to commemorate the Festival of Britain. Considerable numbers of latest type steel corridor carriages, restaurant and kitchen cars will be completed this year, and 110 more buffet car services are running each week than last year, while there are as many dining cars as last summer, with a slight increase in the number of Pullman and sleeping cars scheduled.

The L.M.R. Carnarvon-Llanberis branch has been opened again for excursions, providing easy access to the Snowden Mountain Railway. Steamship services to Ireland and the Continent are being augmented for the summer season. Two new motor vessels coming into service are the 3,200 ton "*Norfolk Ferry*" operating on the Harwich-Zeebrugge train ferry cargo route, and the 830 ton "*Shanklin*," replacing a former paddle steamer of the same name and providing fast and increased passenger accommodation on the short but busy crossing between Portsmouth and the Isle of Wight.

Western Tidings

During May last the gas turbine locomotive No. 18000 was hauling the 7.30 a.m. Paddington to Bristol train, returning to London with the 12.0 noon from



A Southern push-pull train amid typical scenery on the Tunbridge Wells - Oxted route. The engine is a Billinton D3 0-4-4T. Photograph by C. R. L. Coles.

Temple Meads, due back in London at 2.40 p.m., in each case calling at principal stations. Further reports have reached us of remarkable hill climbing and accelerative powers displayed by this exceptional machine.

Ten "County" class 4-6-0s were lately transferred to Laira or Penzance sheds. More "Halls" also were sent to Laira (Plymouth, 83D). In each case the smaller driving wheels are probably of advantage for surmounting the steep gradients in the west there being now fewer "Castles" in that area.

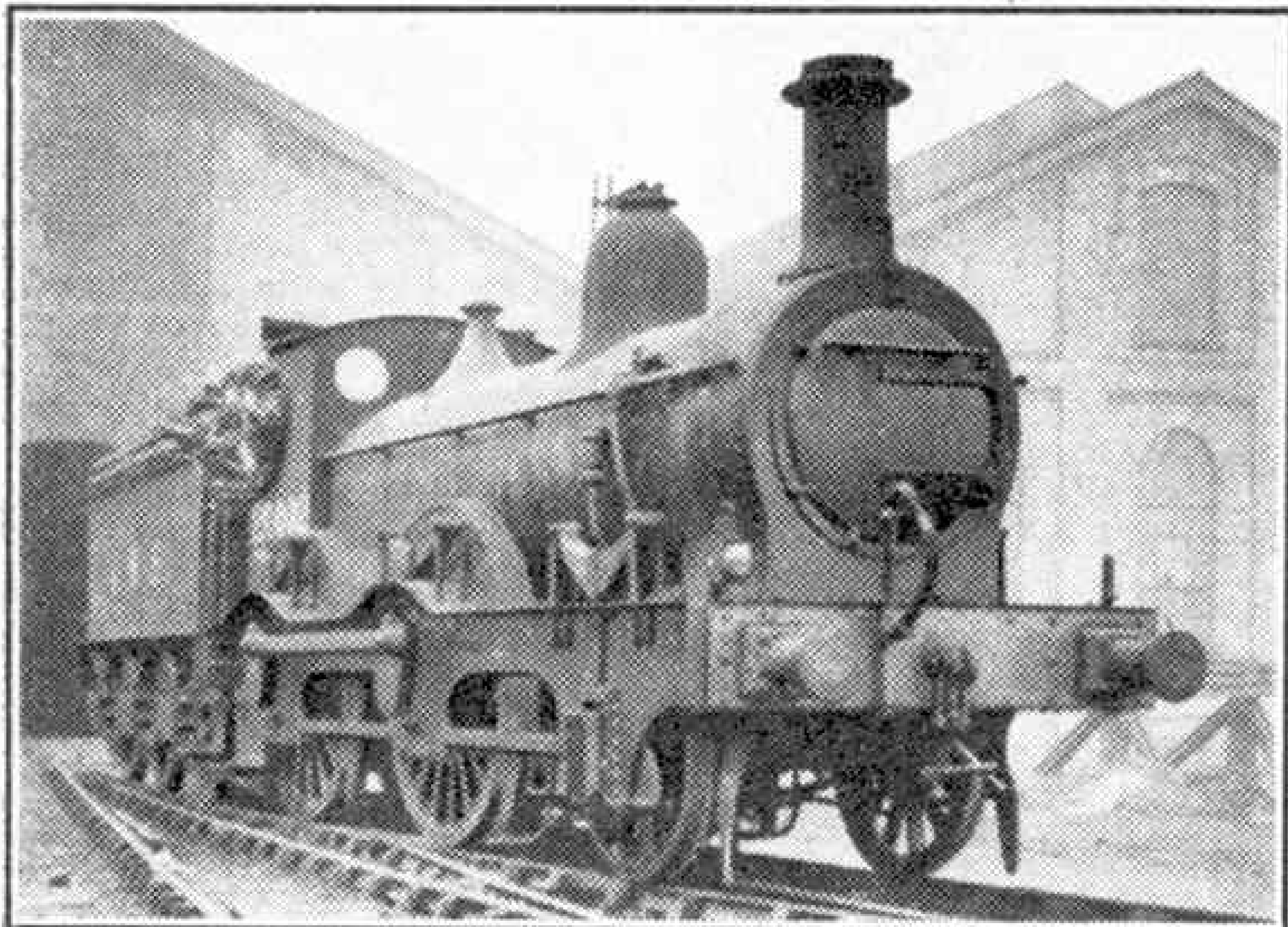
Rare engines lately noted in the Slough-M Maidenhead neighbourhood on the main line were No. 4403 of the 44xx 2-6-2T class, on local goods; former M and SWJ 2-4-0 No. 1336, one of the three remaining locomotives of that wheel type on the W.R., stationed at Reading, 81D; and one of the last surviving "Bulldog" 4-4-0s, on ballast or Engineers' trains.

A good deal of relaying work has been going on along the main lines between Paddington and Reading.

"Saint" 2-cyl. 4-6-0 No. 2951 "*Tawstock Court*" passed on a Cheltenham express. No. 2981 "*Ivanhoe*" of that class has been condemned. More 0-6-0 pannier tanks have been placed in service, including Nos. 1638-45 of the light type, built at Swindon, and Nos. 8429, 8469, 9441-5 of the heavier design, constructed by contract.

Southern Miscellany

We are informed that No. 36001, the first "Leader" 0-6-6-0 tank engine, has been dismantled or broken up at Eastleigh, never having gone beyond the experimental stage. It was built at Brighton in 1949, two others being almost completed and put into store. The locomotive figuring in the Southern illustration this month is of the "D3" or early "bogie tank" class originated by the L.B.S.C. in 1892. A Drummond "M7" L. and S.W. 0-4-4T, No. 30027 from Horsham, ran for a time on similar duties. A finely appointed set of new Pullman cars began operating in the "Golden Arrow" boat express during June. This well known train runs between London Victoria and Dover Marine, London-Paris service.



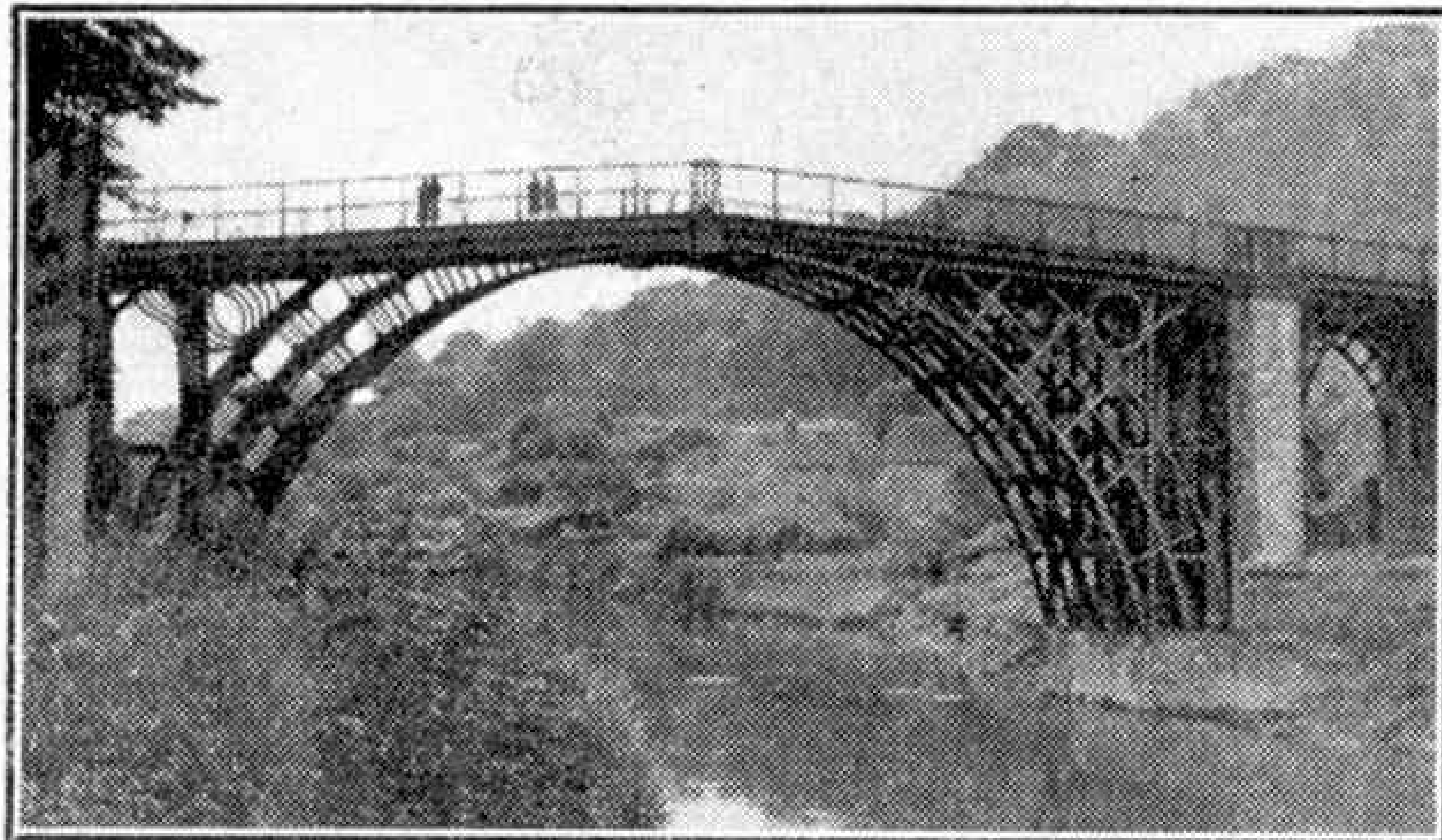
The last remaining Kirtley 2-4-0 of the former Midland Railway that is to be preserved as stated in "Railway Notes" last month. Photograph by H. C. Casserley.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

THE FIRST IRON BRIDGE

Coalbrookdale, Shropshire, some 12 miles down the River Severn from Shrewsbury, was the cradle of the iron trade in the 18th century, by reason of the



The first iron bridge in the world, which crosses the Severn at Coalbrookdale. Photograph by H. A. Whiteley, Kidderminster.

discovery by Abraham Darby of a method of producing coke from coal. It was not surprising, therefore, that when a bridge was required over the River Severn some few miles away from Coalbrookdale, the new material cast iron was used. This bridge, shown in the accompanying illustration, was the first built of iron in this country, and was constructed in 1777 by Darby. It gave its name, Ironbridge, to the town that grew up around it.

The bridge is 196 ft. long, with a central span of 110 ft. and two smaller ones, and the weight of iron used in building it was about 380 tons. Modern traffic conditions have made it necessary to construct a new bridge further down stream, but the old bridge still stands as a magnificent memorial to the pioneers of the new iron age.

H. A. WHITELEY (Kidderminster)

THE INDIAN BIRDMAN

That attractive Indian character popularly known as the Birdman travelled round the towns and villages with a number of small performing birds. He was a picturesque figure with a long white beard and patient, kindly eyes, and was a great favourite with grown-ups and children alike. His appearance with a tall wooden stand, on which the

birds perched at will and were carried about, was always hailed with delight, and probably still is.

Among the birds carried was the Indian sparrow or myna, a larger bird than his prototype in Britain. Although most of the performers were very tiny,

they were all equally perky and intelligent and cheerfully did their bit in the show. One of their many accomplishments was picking out numbered cards, as called by the Birdman. Others were testing coins, by ringing them on the ground; threading beads, by holding a large threaded needle in the beak and pushing it through each bead; and fetching a leaf from a tree near by and placing it between the lips of the master, as in the accompanying illustration. The birds were never far away from their open "cage" and followed the Birdman wherever he moved.

One marvels at the patience obviously employed in teaching these small winged creatures.

V. HALLAM (Fleet, Hants.)

HOUSE MOVING IN THE WEST INDIES

On the island of St. Kitts, in the Leeward Island group of the British West Indies, I saw a native family having their house moved.

When we say that we're going to move we don't

take our house with us, but in the West Indies the natives do this. They rent a plot of land and build on it a small house of wood and corrugated iron supported on thick stakes of wood about 4 ft. from the ground. When they want to move they hire a flat truck and driver, and about half a dozen empty oil drums. They stand the drums on end under the house, and pull out the piles so that the house rests on them. Then they reverse the lorry under the house and gradually lower it on to the truck.

While these operations are going on, a crowd of sight-seers, mainly native, gather round the house shouting their opinions at the removers. After the house has been lashed on to the lorry, this is driven slowly, because the house wobbles violently. It goes down the street to the new site, where the house is put up again.

All this works out much cheaper than buying a new house. Incidentally, the household's livestock, sheep and goats, follow the lorry. It is interesting to compare this practice with the removal of buildings in the United States.

C. FARARA (London, N.W.2).



The Indian Birdman. Photograph by V. Hallam, Fleet, Hants.

Novel Grab for Cranes

A Useful Idea for Model-Builders

EVERY Meccano boy at one time or another builds a model crane. Indeed, many boys make a speciality of such models, for the very wide range of prototypes available, from giant hammerheads to small mobile cranes, provide them with ample scope for their activities. In addition to the large choice of crane types, there is also a wide selection of grabs, buckets and other special forms of lifting tackle available, the fitting of which can add considerable interest to a model and increase the pleasure obtained from operating it.

One special apparatus of this kind is the Extenso grab manufactured by Priestman Bros. Ltd., Hull, which is shown in the illustrations on this page.

The Extenso grab was first developed as a result of the difficulty that farmers experienced in handling that very valuable material—farmyard manure. Owing to the urgent need for mechanisation to increase production during and immediately after the war, some manufacturers had

already produced small mobile cranes, and one of the many duties of these cranes was to handle farmyard manure by means of a grab. Although many different

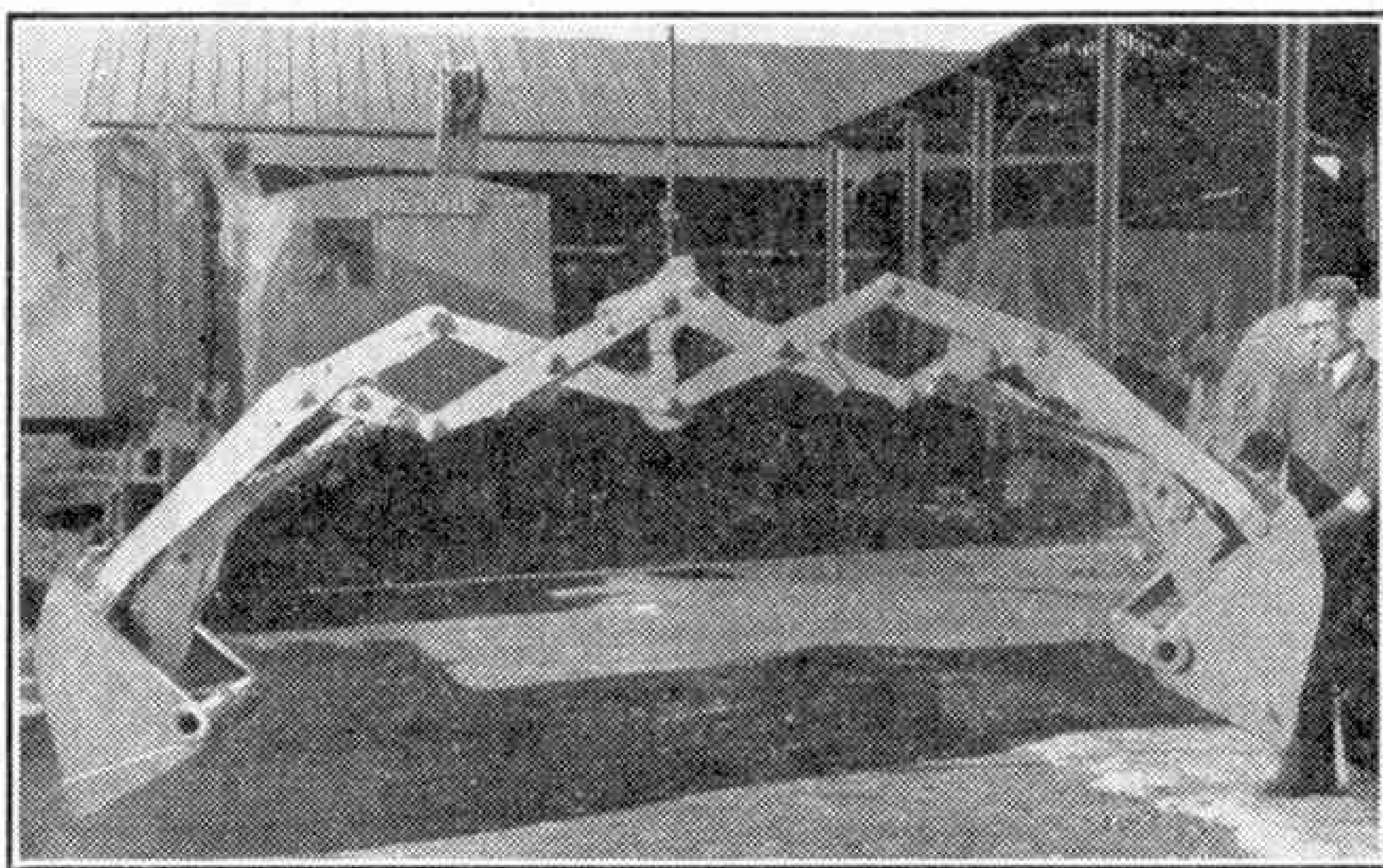


Fig. 1. The Extenso Grab fitted with solid jaws for handling rubble and masonry.

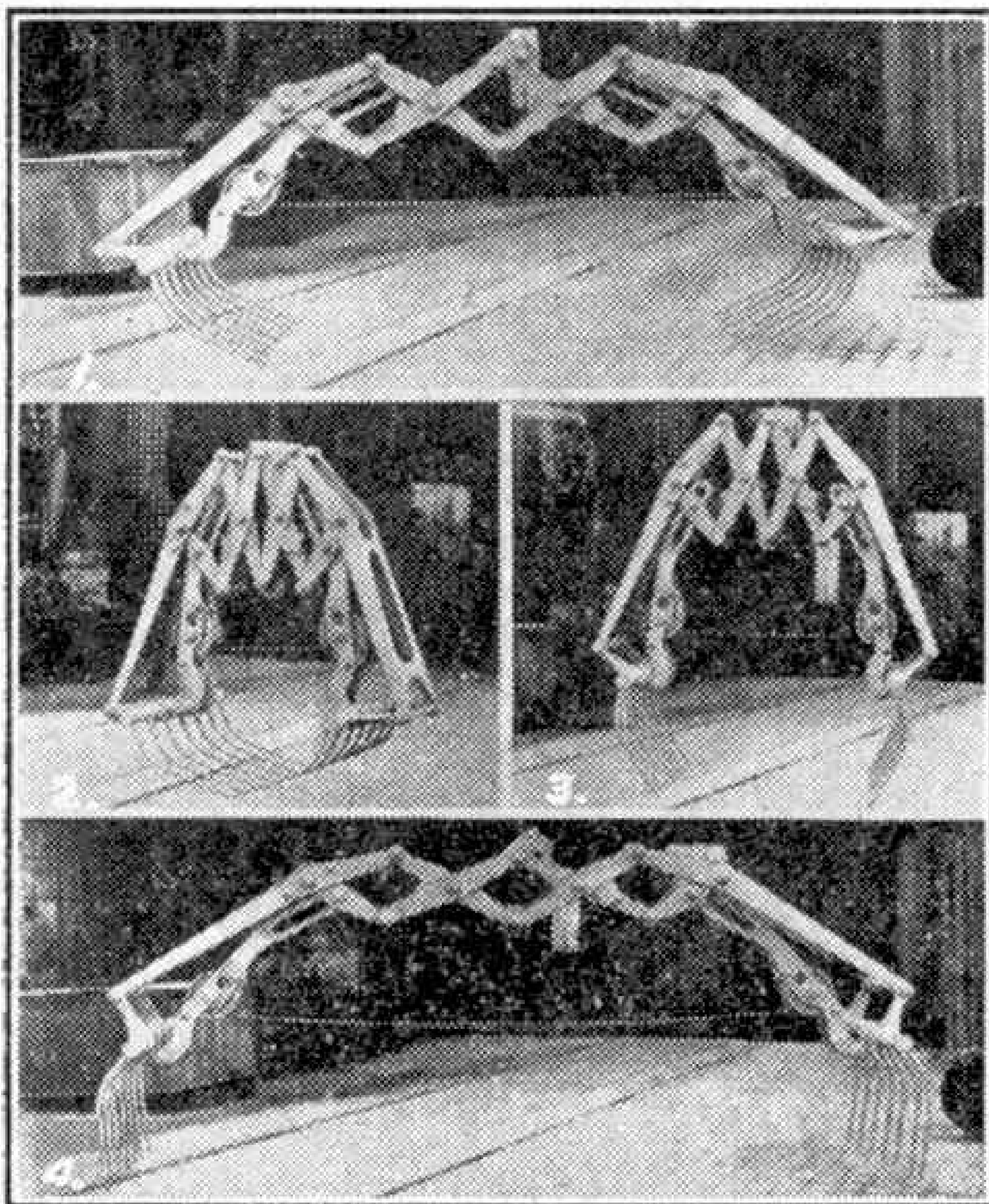


Fig. 2. These illustrations show four positions in the operation of the Extenso Grab manufactured by Priestman Bros. Ltd., Hull.

kinds of grabs had been tried they had not proved completely successful in dealing with this material, because although it is easy to penetrate, and a small grab can lift comparatively large loads, it is very difficult to obtain a complete discharge of the material from the grab jaws. Another difficulty is that unless carefully handled a grab is likely to dig deeply into the material and anchor itself.

Experiments showed that the best solution would be provided by a grab having a very wide "spread," and as a result the first Extenso grab was produced. On preliminary trials it was found to be very successful and was able to handle loads of material of more than twice its own weight.

The grab is operated by a crane having two separate rope drums, the "holding" rope being attached to the opening arms in the centre of the grab, and the "closing" rope being reeved around the grab sheaves and anchored inside the grab to give the digging purchase. The grab is landed on the material with the jaws in the maximum open position as shown in view No. 1, Fig. 2, and as the closing rope is tightened the jaws turn inward to the digging position as shown in view No. 3. The crane driver then continues to take in the closing rope until the grab reaches the closed position as shown in view No. 2. In this position it is lifted out of the material and swung over the discharging point. The crane driver applies the brake to the drum accommodating the holding rope and releases the closing rope. This allows the jaws to fall open to the position shown in view No. 4 and the material falls away.

The grab is extremely flexible and because of this feature it was decided to adapt it for handling rubble and masonry during air-raid shelter demolition. A normal type of "clamshell" grab has to be very strongly constructed to undertake such hard work because large pieces of the material sometimes become wedged across the jaws and cause considerable distortion.

Model-Building Competition Results

By "Spanner"

"New Year" General Contest— Home Section.

I always look forward to the competitions organised during the winter months for they usually attract a large number of really interesting models, the outcome of many pleasant and happy hours spent by Meccano boys during the long dark evenings. When I see some of these fine models and realise the great amount of thought and time put into their construction I think that those which achieve success in these "M.M." Contests fully deserve their distinction. The Home Section of the "New Year" Competition, which was announced in the January issue of the "M.M.," produced a very fine crop of entries, and was one of the most successful since the war.

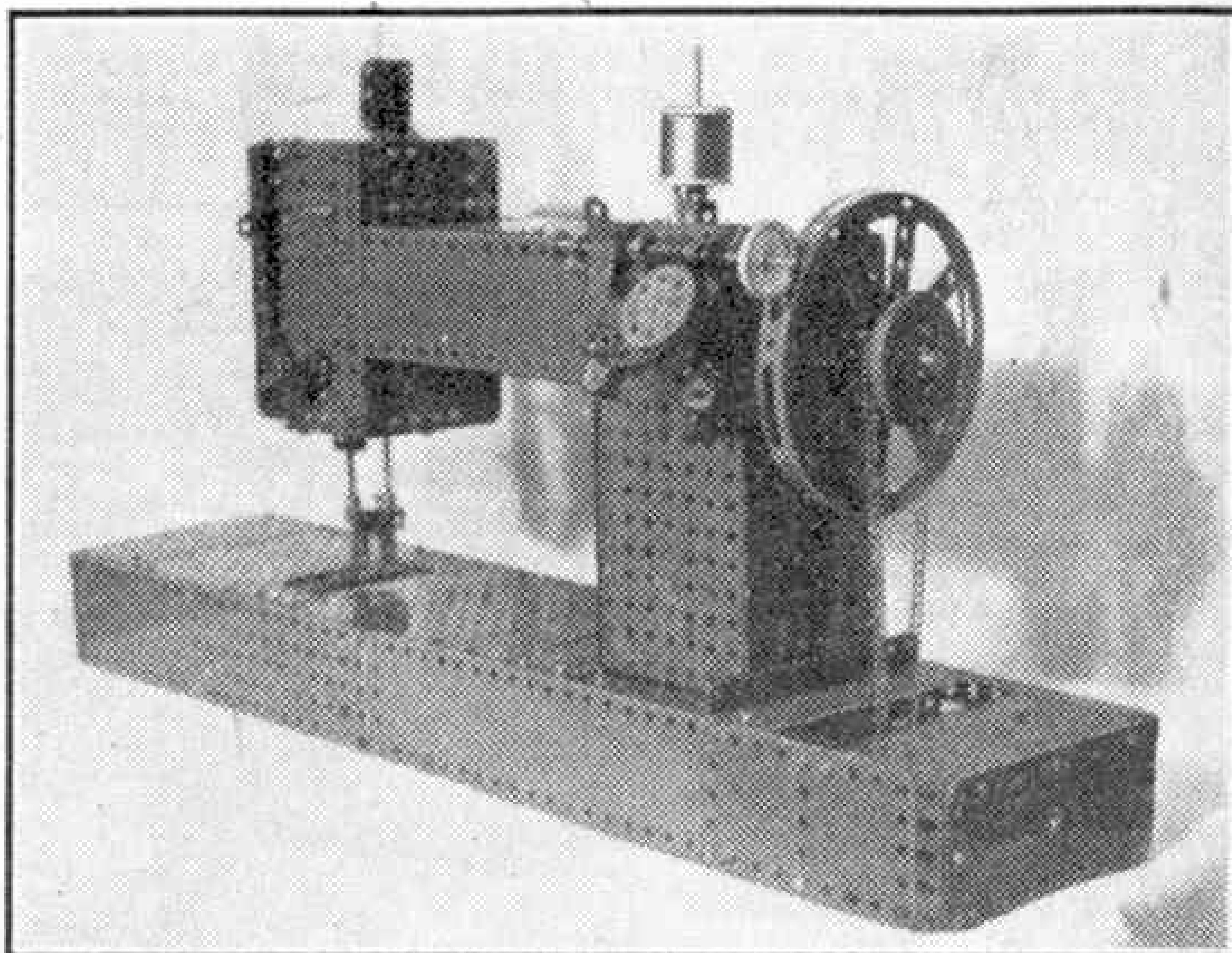


Fig. 1. An interesting sewing machine built by M. L. Murdoch, Hoole, Chester. It was awarded First Prize.

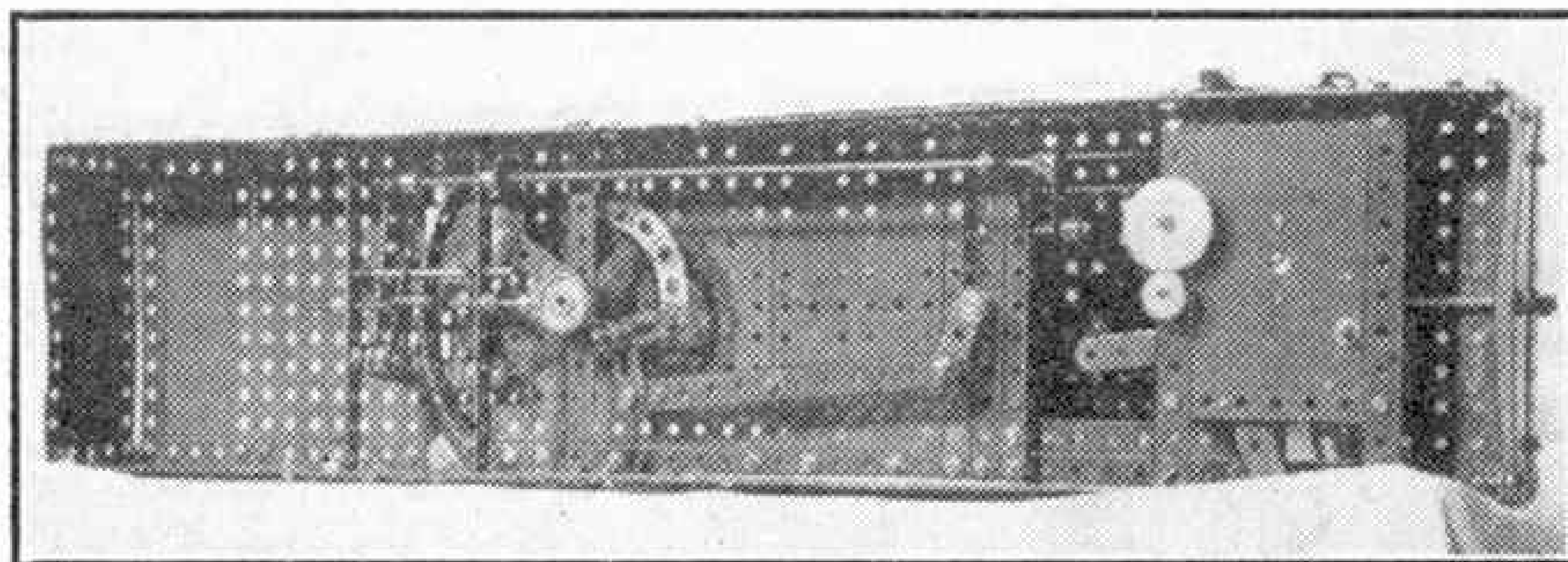


Fig. 2. Underneath view showing the mechanism in the bed of the sewing machine seen in Fig. 1.

The judges found it a difficult task to decide between the merits of many of the entries, but by taking the age of each competitor into consideration, they were able finally to arrive at a fair decision.

Their awards were as follows:

First Prize, Cheque for £3/3/-: M. L. Murdoch, Hoole, Chester. Second Prize, Cheque for £2/2/-: K. W. Cameron, Birkenhead. Third Prize, Cheque for £1/1/0: R. Brown, Oakham, Rutland.

Ten Prizes each of 10/6: D. and J. Stoddart, Stockton-on-Tees; R. J. Dibley, Eastbourne; P. Body, Swansea; H. W. Henry, Strood, Kent; E. L. Wilkes, Peterborough; G. Merlane, Nottingham; I. Pilkington, Liverpool 16; W. E. Jones, Chalfont St. Peter; J. D. Gostt, Shenfield, Essex; J. B. Wilson, Huntingdon, Hunts.

Ten Prizes each of 5/-: M. Stephenson, Southport; E. Howell, Dronfield; M. W. Kemp, Hastings; M. D. Fox, Seaham

Co. Durham; M. K. Batt, Totton, Nr. Southampton; D. R. Davies, Harrow; B. S. Daniels, Dukinfield, Cheshire; A. Stroud, Silchester, Nr. Reading; B. Watts, Appleton, Berks.; J. W. Bunting, Coventry.

For me the most interesting entry was that of M. L. Murdoch, Chester, who submitted a table sewing machine

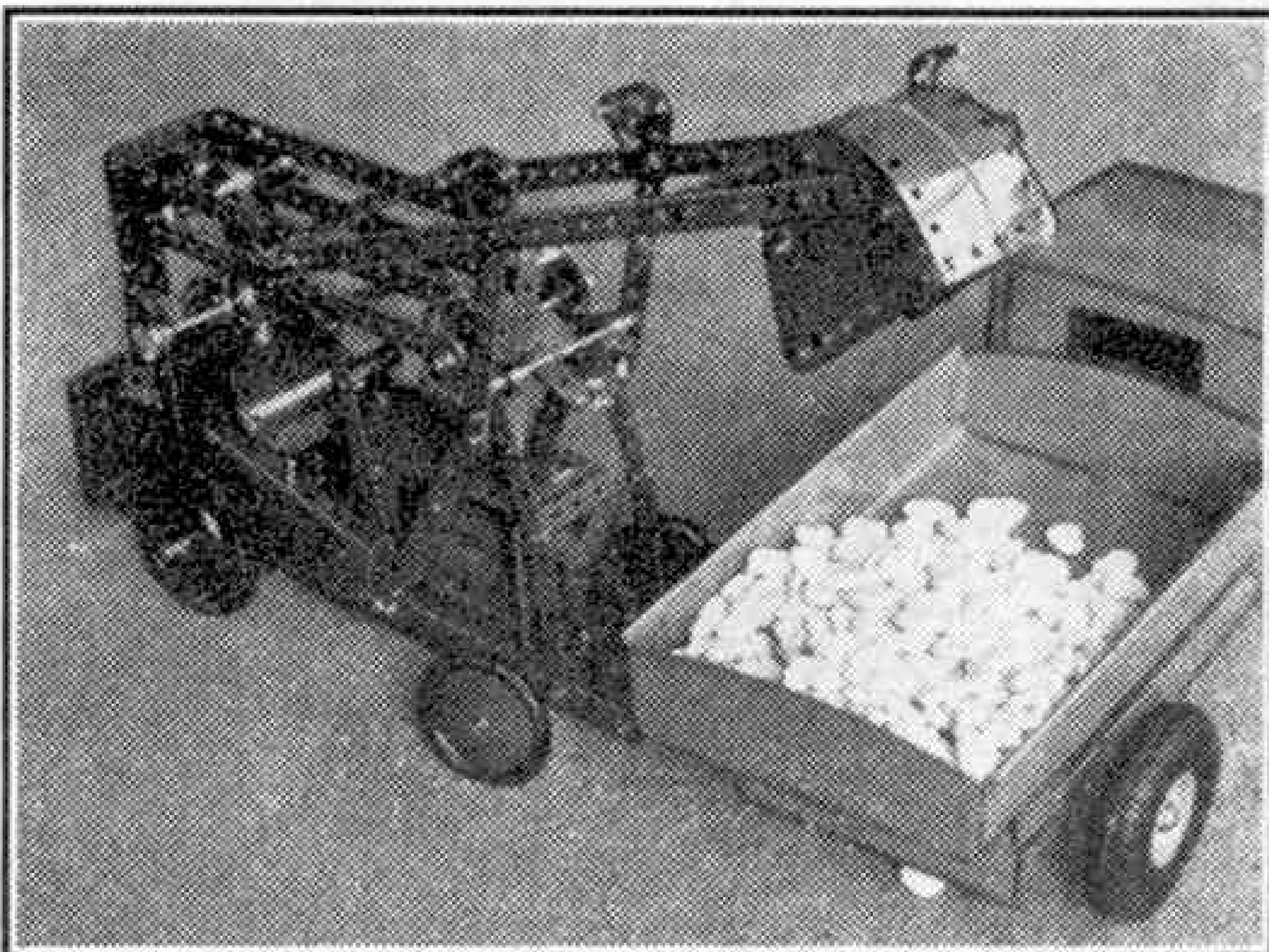


Fig. 3. A simple working model of a Muir-Hill Loader, which won Second Prize for K. W. Cameron, Birkenhead.

for which he was awarded First Prize. The mechanism of the model was based on the Singer type of motion, and a very good attempt indeed was made to reproduce its various functions. The model is shown in one of the accompanying illustrations.

The cloth feeding teeth, which are a feature of a sewing machine, are operated in this model by an eccentric on the main driving shaft. The shuttle consists of a Sleeve Piece having a cardboard point at one end and a Chimney Adapter at the other. A Bolt through the end hole of this can be removed in order to insert the bobbin. The spool winder was provided with a snap "on and off" mechanism, and other items were a clutch in the flywheel drive to allow the spool winder to operate without the needle and shuttle mechanism being driven.

This model owed its success very largely to its originality, but it was also well-constructed and was given an outline as realistic as possible with the parts available to its builder.

Second Prize was won by a quite small and insignificant model of a Muir-Hill Loader built by K. W. Cameron,

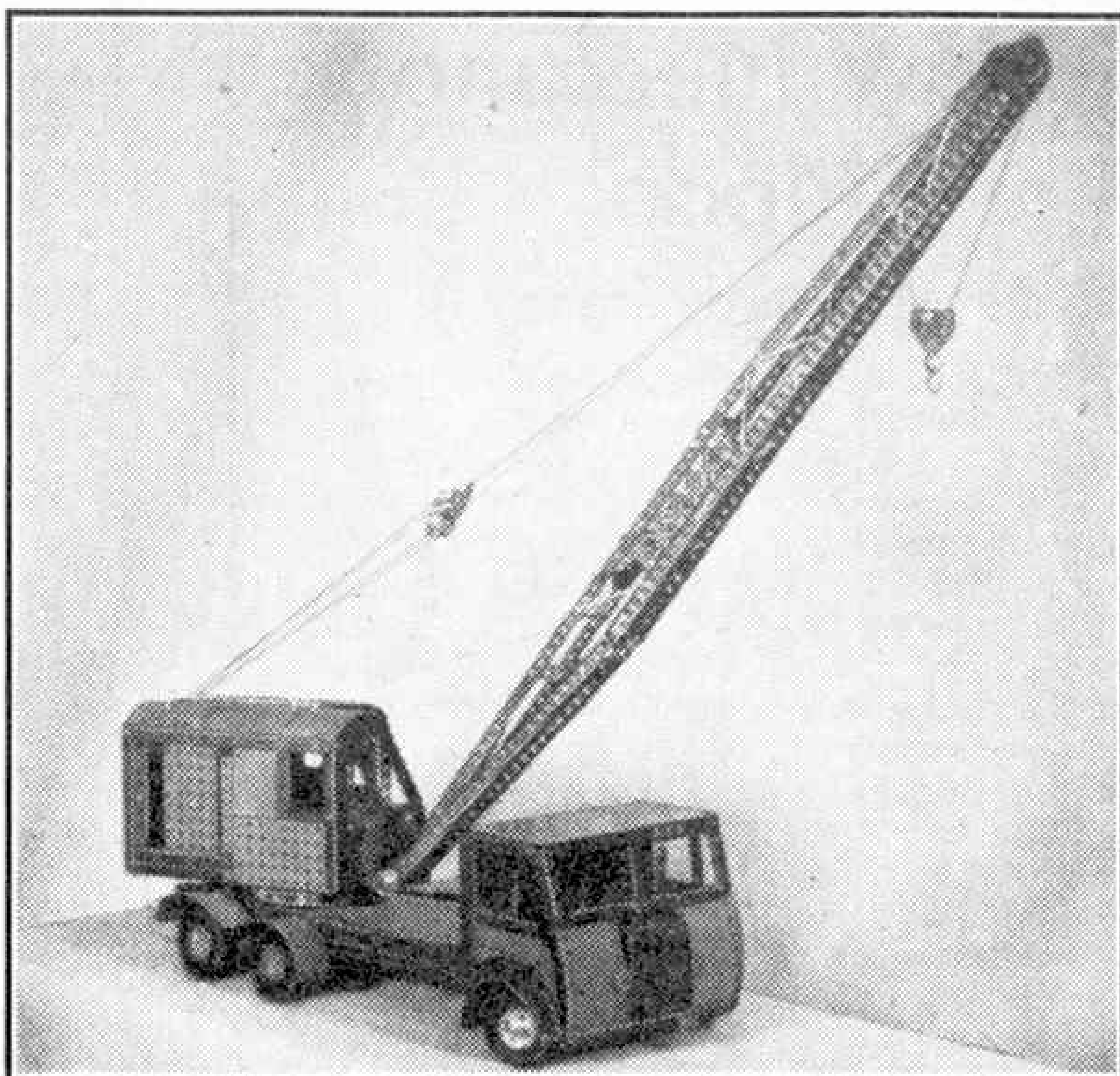


Fig. 4. A lorry crane built by Roland Brown, Oakham.

Birkenhead. In spite of its comparative simplicity, however, this model carried out the functions for which it was designed quite as accurately as it could have done even if built on a much more elaborate scale. This was due to very good planning on the part of the builder and skilful application of the parts used in its construction, all of which are I think contained in a No. 7 Outfit.

Readers will see from this, therefore, that it is not necessary to possess a large Outfit and to build a big and complicated model in order to win a prize in an "M.M." Contest. The judges always give full credit for sound design, originality of subject and realistic construction, and the size of the model is a very minor consideration, unless of course it is coupled with some of the more important qualities I have mentioned.

Neat construction was the main consideration in awarding Roland Brown, Oakham, Third Prize for his model of a lorry crane.

There are many more models that I would like to mention but unfortunately space does not permit this.

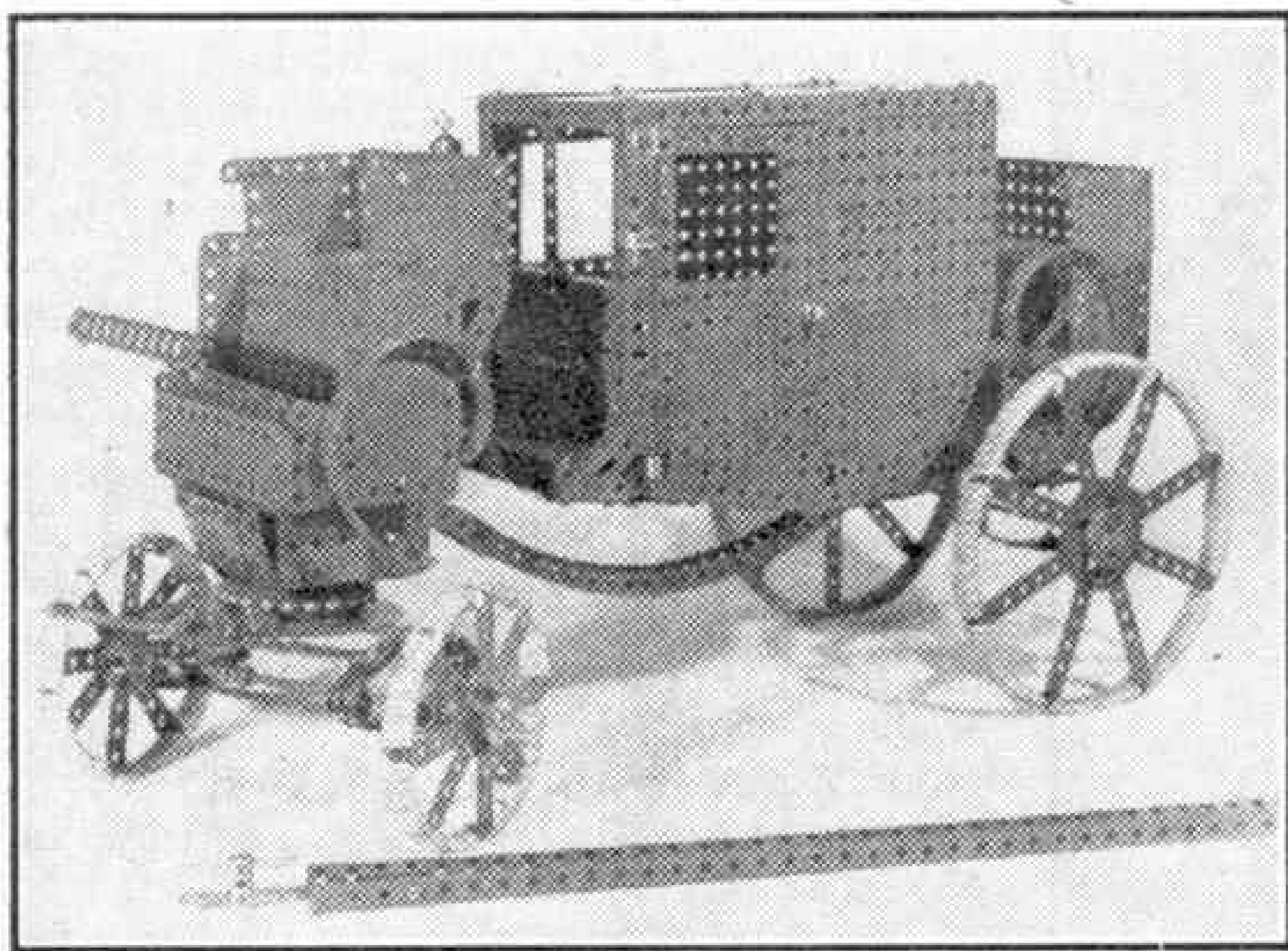


Fig. 5. G. Merlane, Nottingham, was awarded a prize for this realistic and well-built model of a Barkerville stage coach, in active service about 1800.

New Meccano Model

Shipyard Crane

THE top of the crane tower is a square framework made from four $9\frac{1}{2}$ " Angle Girders. A further $9\frac{1}{2}$ " Angle Girder is bolted across the centre of the framework and is extended on each side by a $9\frac{1}{2}$ " Strip Plate 1. The outer edge of each of these Strip Plates is braced by a $9\frac{1}{2}$ " Angle Girder, and a Hub Disc 2, fitted at the centre with a Bush Wheel, is bolted to the framework. A 3" Rod 3 is fixed in the Bush Wheel.

Each leg of the tower consists of three $18\frac{1}{2}$ " Angle Girders. These are connected together at their lower ends, and are attached at the top to $1\frac{1}{2}$ " and 1" Corner Brackets as shown in Fig. 3. The legs are braced by Strips of various lengths, Trunnions are fixed to their lower ends so that the completed model can be screwed to a suitable baseboard.

The spider of the roller bearing is shown separately in Fig. 2. It is made by bolting eight $1\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Brackets radially to a Face Plate, and each carries a 2" Rod fitted with a $\frac{3}{4}$ " Flanged Wheel. The Rods are held in place by Collars, and the complete spider is slipped over Rod 3.

The base of the cab is made by connecting two $9\frac{1}{2}$ " Angle Girders at each end by $7\frac{1}{2}$ "

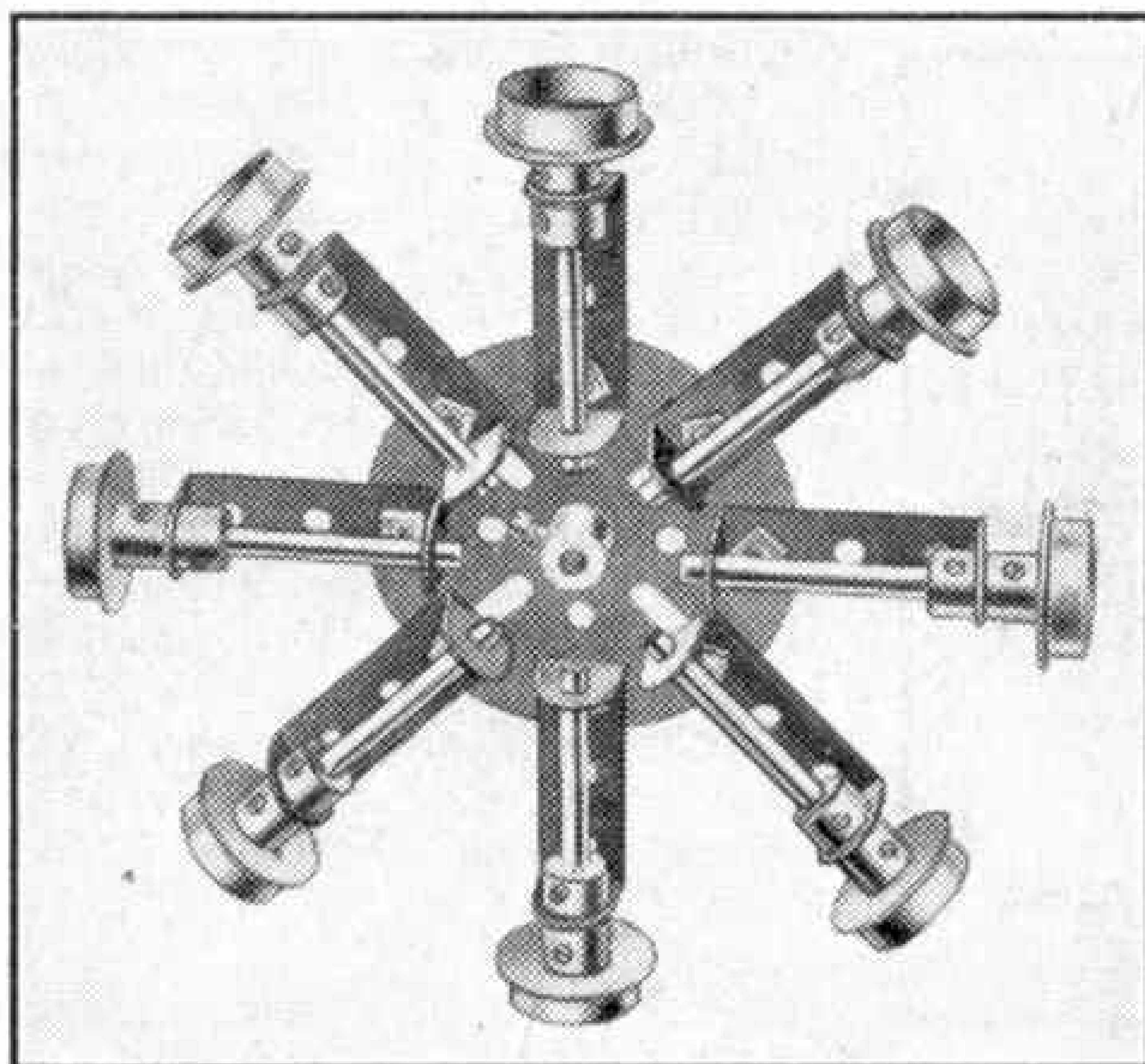


Fig. 2. The spider of the roller bearing on which the superstructure rotates.

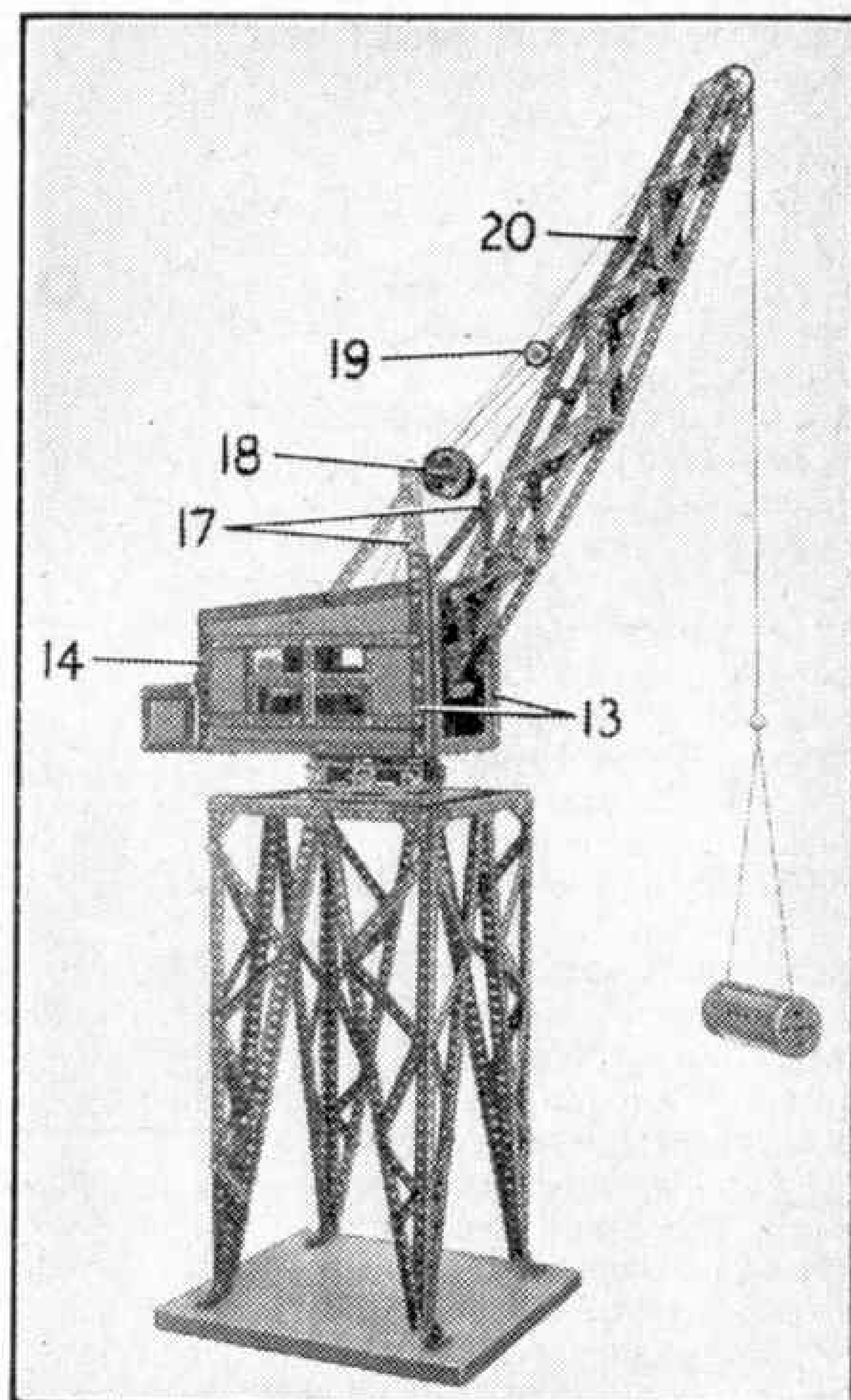


Fig. 1. A working model shipyard crane driven by a 20-volt Electric Motor.

Angle Girders, and the joints are braced by $1\frac{1}{2}$ " Corner Brackets. A further $9\frac{1}{2}$ " Angle Girder 4 and two similar Girders 5 are bolted to the base. A Hub Disc 6, forming the upper ring of the roller bearing, is bolted to Girders 4 and 5, and the assembly is then passed over Rod 3 and held in place by a Collar.

The cab base is extended at the rear by a box made from $2\frac{1}{2}$ " and $7\frac{1}{2}$ " Angle Girders as shown. The floor of the box is plated by $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flat Plates, and the power unit, an E20R Electric Motor, is attached to $\frac{1}{2}$ " Reversed Angle Brackets bolted to the floor.

A $\frac{1}{2}$ " Pinion on the Motor shaft meshes with a 57-tooth Gear 6, and a $\frac{1}{2}$ " Pinion on the same Rod as the Gear meshes with a further 57-tooth Gear on a Rod 7. A $\frac{3}{4}$ " Sprocket on Rod 7 is connected by Chain to a 2" Sprocket on the gear-box input shaft.

The sides of the gear-box are $2\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flat Plates, and they are bolted to the Girders 5. The input shaft carries a $\frac{1}{2}$ " Pinion 8, and is held in position by a

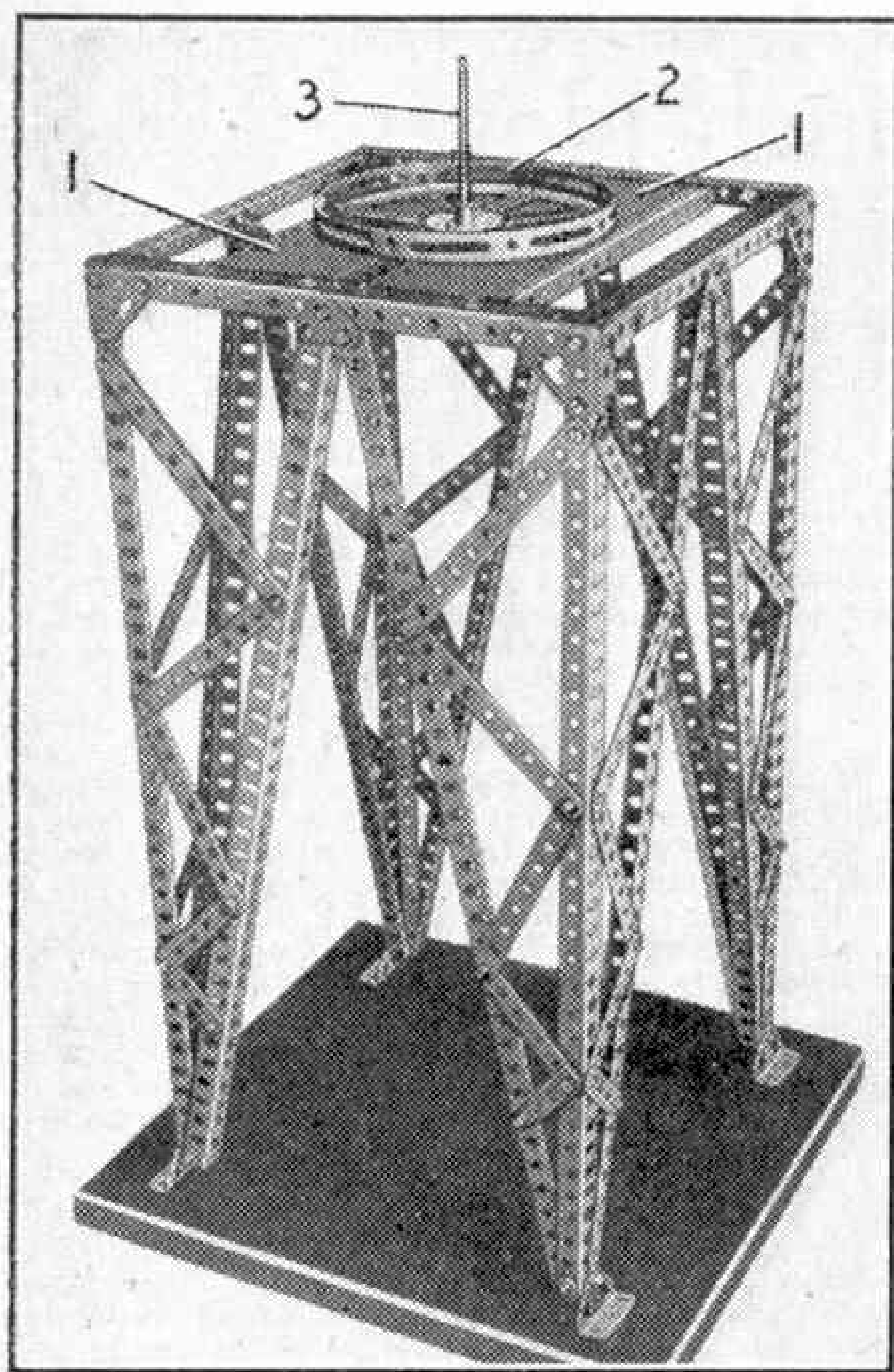


Fig. 3. Tower and lower race of the bearing for the swivelling superstructure.

Collar. A sliding shaft 9 is mounted on each side of the input shaft. Each sliding shaft carries a Collar 10, two Bush Wheels 11, and a 57-tooth Gear 12. The operating Cords wind between the Bush Wheels, and the Gears are arranged so that either can be moved into mesh with the Pinion 8 by operation of a control lever. Each shaft is braked when the Gears are out of mesh by a $\frac{3}{8}$ " Bolt screwed into the Collar 10, engaging a similar Bolt held by a nut in the side of the gear-box.

The cab side uprights are formed by a $7\frac{1}{2}$ " Girder 13 at the front and a $5\frac{1}{2}$ " Girder 14 at the rear. The sides are plated, using Flexible Plates of various lengths arranged as shown and edged by Strips to form windows.

The control levers are $2\frac{1}{2}$ " Strips 15 attached to Cranks pivoted on a Rod 16. Rod 16 is mounted in a $2\frac{1}{2}$ " \times 1" Double Angle Strip bolted to the side of the cab. The levers are linked to their respective shafts by $\frac{3}{8}$ " Bolts screwed into Collars on

the shafts. The Collars are loosely mounted, and the Bolts are prevented from unscrewing by nuts tightened against the Collars. A fixed Collar is locked on the shafts on each side of the loose Collar, so that by operating the levers the shafts can be slid in their bearings.

Each side of the jib consists of four $12\frac{1}{2}$ " Strips arranged as shown in Fig. 1. The Strips are bolted to Flat Trunnions at their outer ends, and the sides are linked across by a series of $2\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strips. The jib is braced by Strips of various lengths, and it pivots about a Rod mounted in Corner Gussets bolted to Girders 5.

The Girders 13 are extended upward by $4\frac{1}{2}$ " Angle Girders 17, braced to the cab sides by $5\frac{1}{2}$ " Strips. A $6\frac{1}{2}$ " Rod 18 fitted with a 1" loose Pulley and two 2" Pulleys, is mounted in the end holes of Girders 17. Two 1" loose Pulleys 19 are mounted between Collars on a Rod fixed in two Couplings. These Couplings are fitted with 5" Rods held in Rod Sockets that are screwed into a Coupling 20. The Coupling 20 is fixed on a Rod mounted across the jib.

The luffing Cord is tied to its drum and is taken over one of the 2" Pulleys and round one of the 1" loose Pulleys 19. It is then passed round (Continued on page 334)

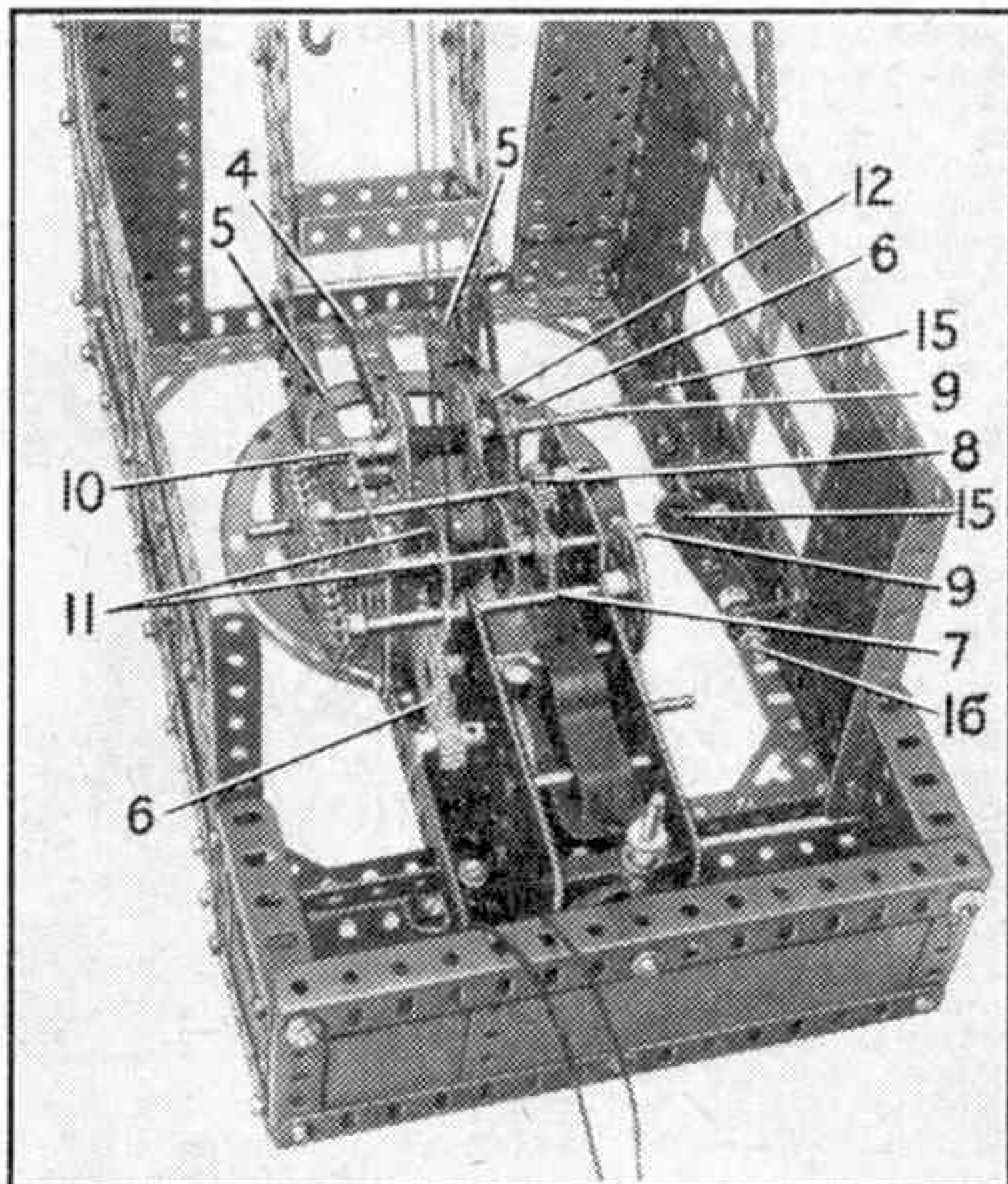


Fig. 4. The mechanism and Motor inside the driver's cab, the roof of which has been removed.



Club and Branch News



WITH THE SECRETARY

GOOD WEATHER HOPES

I hope the weather is proving kinder this year than it was in the summer of 1950, when rain sadly hampered outdoor activities. In most Clubs these appear to be taking the usual form of cycle runs, rambles and excursions afoot, by bus or by train, and photographic sections, where these have been formed, also are planning ways and means of securing good photographs. I hope that these will include interesting pictures of Club members afield, as I should like to reproduce more photographs of this type during the coming months.

SOMETHING TO SEE AND ADMIRE

While enjoying the delights of outdoor games and events, those in charge of a Club or Branch, and indeed all members really interested in its progress, no doubt will be thinking ahead and working out schemes for adding to the interest and variety of Club Room occupations. During recent months members of the Junction Road School (Brentwood) M.C. have included among their many activities the construction of a splendid model aerodrome. This is a useful pointer to an additional programme item of real promise that will give members and their friends something definite to see and to admire.

A scheme such as this keeps members busy throughout a long period, and there should be no difficulty whatever in selecting a suitable subject. A particularly useful suggestion is to build a road layout for Dinky Toys operations, which can readily be combined with a section of railway. It adds greatly to the interest of such a model if it can be made to represent a section of the locality of the Club or Branch concerned.

A constructive scheme of this kind need not interfere with Model-building Competitions and Track Nights, which form the backbone of the programme, and indeed can form an attractive addition to them. A proportion of Club or Branch time should be allotted to the work, which lends itself well to distribution in parts among members, and it is fine to see how interest deepens as the various buildings and other sections of the model are finished and placed in position, and the layout approaches completion.

CLUB NOTES

EASTWOOD SECONDARY SCHOOL (GLASGOW) M.C.—The monthly Model-building Competitions attract a splendid variety of entries. A Visit was paid to the Morrison Memorial Church M.C. where there was a good display of models and an excellent Hornby-Dublo railway. Notes on the Club are included in the School Magazine. Club roll: 14. *Secretary:* James Wright, Holmwood Cottage, Netherlee Road, Cathcart, Glasgow, S.4.

BURY GRAMMAR SCHOOL M.C.—Model-Building Competitions have continued, with Cranes, Bridges,

Fairground features and "Anything on Wheels" as subjects. Railway Films also have been shown. Club roll: 33. *Secretary:* John A. Strafford, 13, Maple Grove, Prestwich, Nr. Manchester.

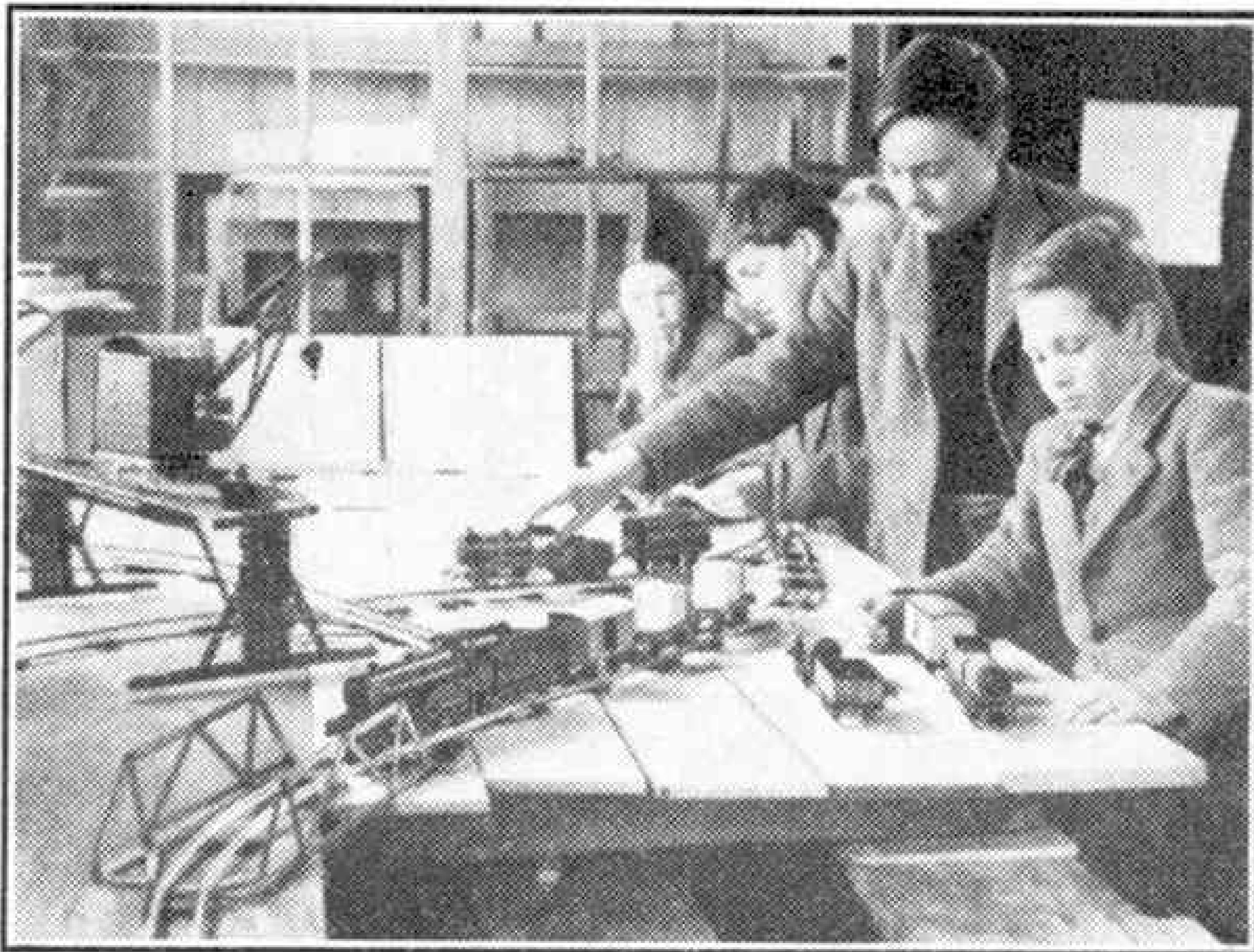
JUNCTION ROAD SCHOOL (BRENTWOOD) M.C.—A fine model aerodrome, measuring 15 ft. x 3 ft. has been constructed, its many features including a field ambulance in addition to aircraft, hangars, runways and a watch tower. A Visit to the R.A.F. airfield at Hornchurch provided useful guidance. Club roll: 42. *Secretary:* Master John Clark, 15, La Plata Grove, Brentwood, Essex.

SOUTH AFRICA

MALVERN (JOHANNESBURG) M.C.—Concentrated efforts on Model-building have given splendid results. A model fair was constructed for display at a special Y.M.C.A. Fete, the working models being driven by electric motors. A successful Visit was paid to a Cement Works, where all operations were minutely followed. The Club celebrated its 30th birthday in April, and on the suggestion of Mr. Sykes, Leader of the Club during the greater part of its existence, a reunion party was arranged to celebrate the event. Club roll: 20. *Secretary:* Miss Jean Weaver, P.O. Box 8, Cleveland, Johannesburg, South Africa.

BRANCH NEWS

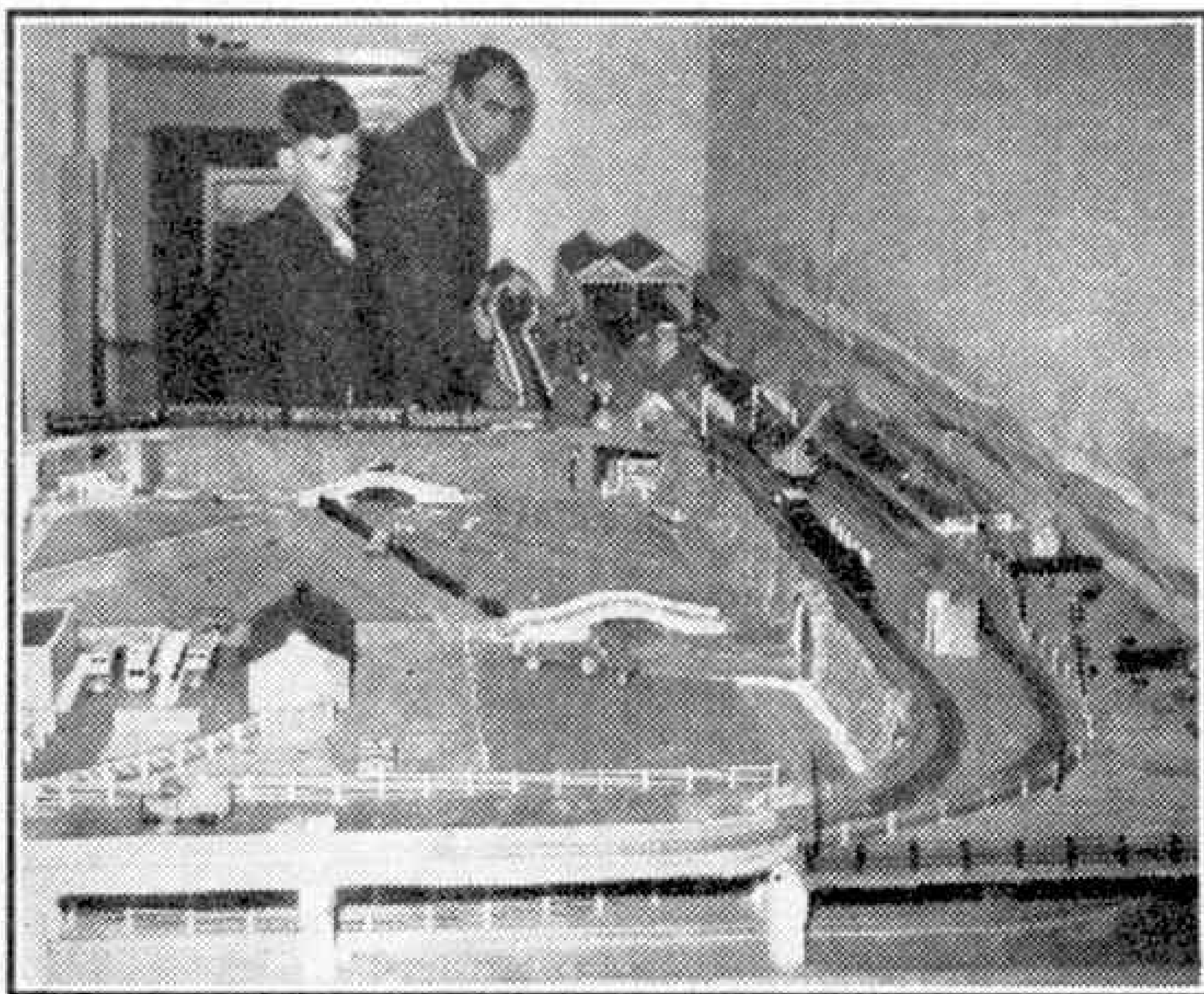
HIGH CRAIGIE (PERTH)—After the New Year season members found themselves proud owners of much new Hornby and Hornby-Dublo stock, and operations on the Branch track have been made more extensive and interesting. Spirited debates have been enjoyed. A Senior Section trip was made to the Eastfield (Glasgow) Locomotive Depot and the Cowlares Erecting Shops. *Secretary:* J. Duncan, "Dunrae," 41, Evelyn Terrace, Craigie, Perth.



Members of the Appleby (Eden Valley) M.C. with their Hornby railway. K. Sowerby, Secretary, is waiting for the signal to start a locomotive. This excellent school Club was affiliated with the Meccano Guild in April last under the leadership of Mr. W. E. Ward, and is pursuing an enterprising programme in which Model-building Competitions play an important part. Solid scale model-building in wood is another popular activity.

A Scenic Hornby-Dublo Layout

THE pictures on this page show parts of the Hornby-Dublo layout belonging to H.R.C. member and "M.M." reader John Peter Blakeman of Cranleigh, Surrey.



Mr. J. C. Blakeman and his son, John Peter, busy with their Hornby-Dublo layout. A miniature motor bus station can be picked out in the distance on the left.

Peter is fortunate in having the enthusiastic help of his father, Mr. J. C. Blakeman, in developing the railway.

The system is laid out on a specially constructed platform of hardboard 7 ft. square, and there are in all three main circuits of track. Two of these are laid out on the main baseboard, but the third is situated on a built-up structure that has been engineered to form a high-level line in relation to the other two.

There is a baseboard extension projecting from the one side of the substructure, and on this the main station and engine shed are situated. Matters are so arranged that the outer low-level circuit is connected with the engine shed, while the high-level system runs down into the main station. The second circuit mentioned previously is really a simple continuous system, but it is placed partly under the high-level section so

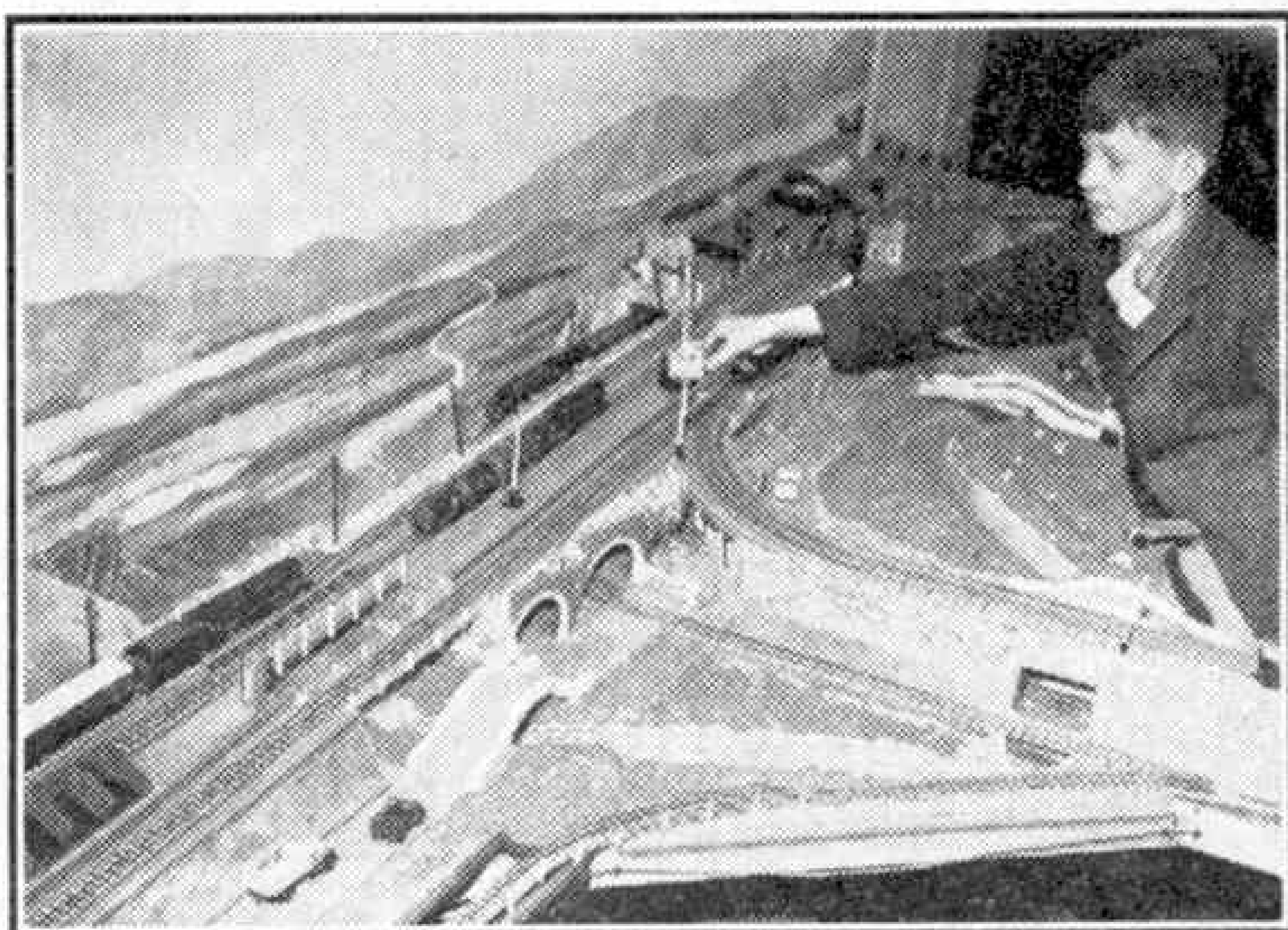
that its isolation is not really noticeable. In fact the running of a train over this circuit is very effective, as it hides itself in successive tunnels, under bridges and so on.

The branch to the main station eventually amounts to five tracks and each of these is provided with an Isolating Rail and Switch. There is therefore plenty of scope in operations, and as each main circuit has its own Transformer and Controller, three trains can be on the run at once, each on its own main track. There are three locomotives, one of each standard Hornby-Dublo type, and additions have been made to the original rolling stock for each so that quite a variety is available.

As the pictures show, lineside and scenic effects have had full attention. The scenic background gives a considerable effect of depth to the layout. In the special features of the countryside, and in the embankment by the high-level line, considerable use has been

made of corrugated paper, glue, sawdust, and alabastine plaster finished off with water colour paint.

Roadways, on which Dinky Toys traffic runs, buildings, road bridges and crossing gates help out the natural effects.



Peter at an attractive corner of the system. The tracks on the left lead to the main station and engine shed section.

The Stanton Central Hornby Railway

THE "*Stanton Central Railway*" is a Hornby Gauge 0 system operated by "*M.M.*" reader Mr. A. R. Casebrook, New Bradwell. The layout has been referred to previously in the "*M.M.*," but recent developments have further increased the interest of the system.

Like many miniature railways, the "*Stanton Central*" has been in a constant state of development for a long time. The layout plan is continuous in order to provide for long non-stop runs, because such long-distance trains as "*The Royal Scot*" in miniature run over it, and a special feature is made of the operation of through-running fast goods trains. Intensive working is the keynote of operations, so that there are four main oval tracks, with sidings and loop lines taken off each of them. Crossover roads are provided to allow trains travelling in either direction to be changed over to any other part of the layout.

In addition, the inner track has four sidings and in the neighbourhood of these is situated a goods depot, with a cattle loading platform, an oil depot and other equipment. Several sidings form the locomotive yard and the sheds there accommodate four locomotives. There is also a repair shop, and a breakdown van and other equipment stand by ready for instant use.

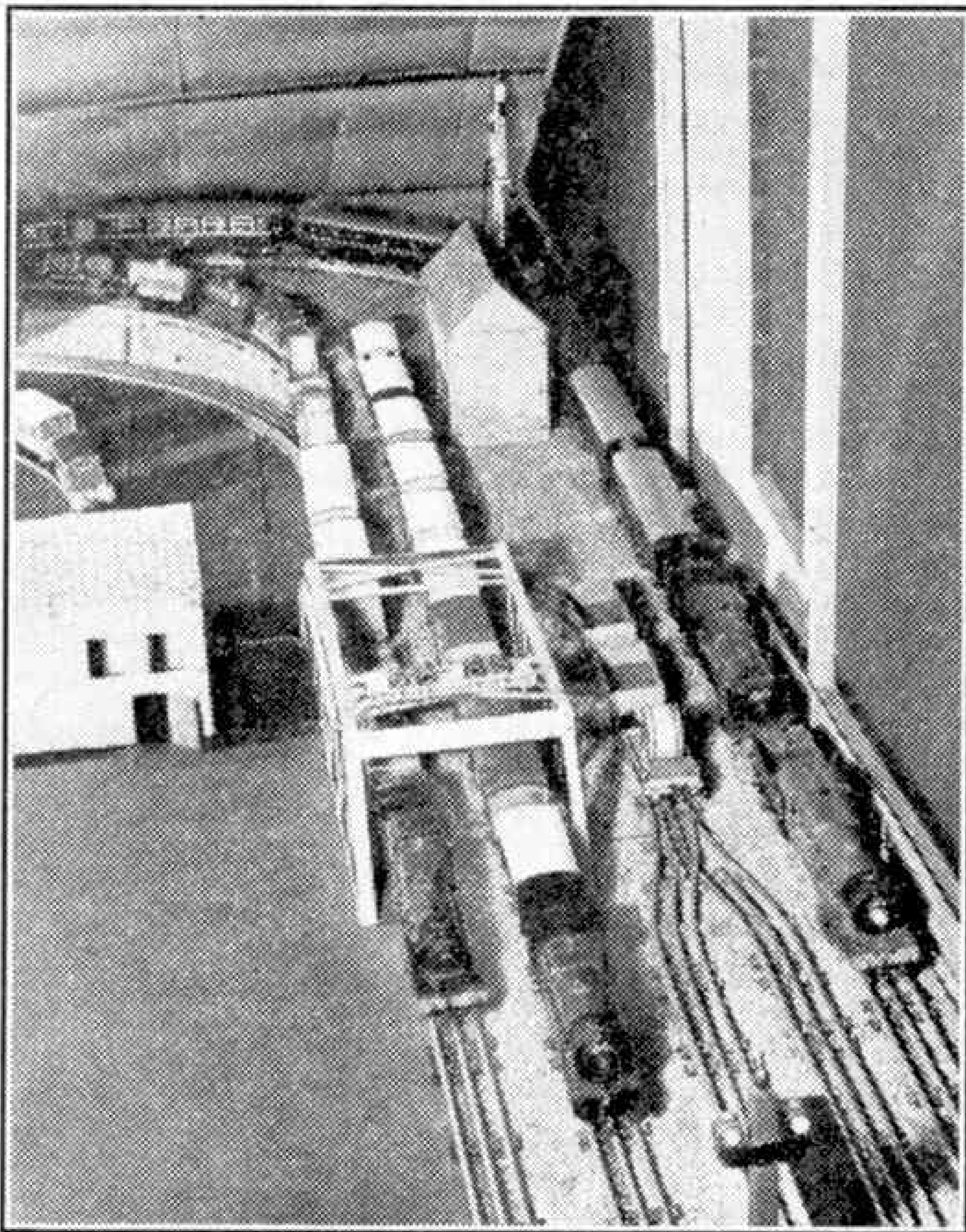
Traffic is dealt with by Hornby 20-volt locomotives of pre-war manufacture and the rolling stock is largely of similar age and type. The whole system is in fact the result of 15 years' development on the part of the owner, who has specialised in the construction of the electrical equipment. The layout is divided into 20 sections that can be controlled separately, and each section, with track circuits, signals, points and so on, is wired to a special central control cabinet.

Colour-light signals are installed, and these are operated by switches that at the same time control the section of track concerned according to the signal indication. In this way trains are prevented from passing a "stop" signal, so that the operator is provided with automatic train control. No train can move into a section that is

already occupied; the line must be clear and the signal showing a green light. In addition, any points concerned must be set correctly beforehand.

Power to the track is wired through circuit breakers, and if one of the latter is tripped out owing to a short circuit due to derailment or other trouble, a coloured light shows the operator the line involved, so that the fault can be cleared without delay. The fact that the current is switched on to any particular track from its Transformer also is indicated.

Throughout a typical operating session, sound effects, including weather noises, are produced by means of suitable equipment. Times of arrival and departure of trains can be announced through a loud speaker. At the same time there are the banging of carriage doors, the clink of buffers, and the shrilling of the guard's whistle, and other typical station noises.



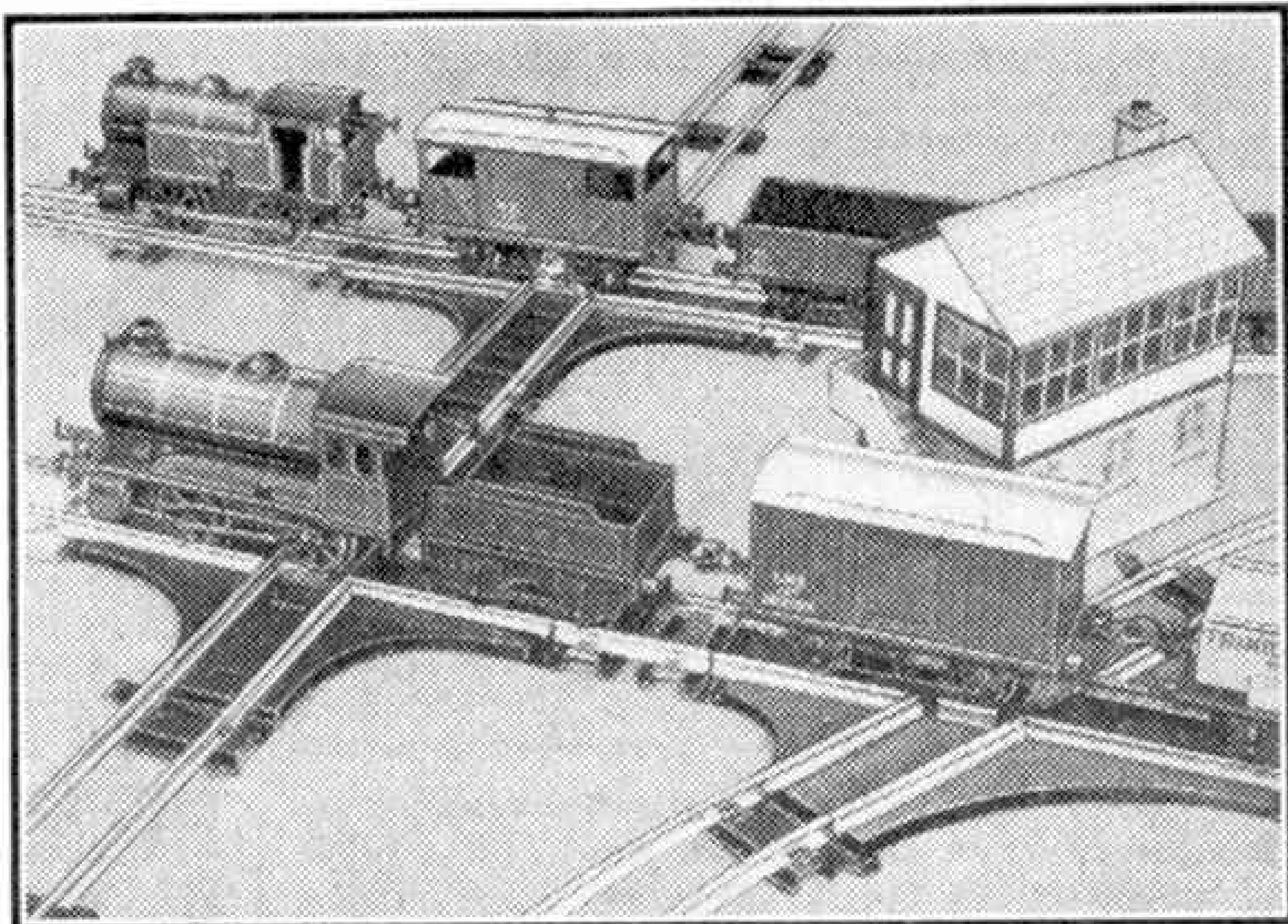
A busy scene on the "*Stanton Central*" layout of Mr. A. R. Casebrook, New Bradwell. Note the double-headed express and the two long freight trains. Photograph by W. A. Adams, Wolverton.

Lineside Notes for Hornby Layouts

MOST Hornby railway owners know that even a portable railway needs some attention to its lineside details if a realistic effect is to be obtained, and they should always try to make the best use of whatever lineside accessories they may possess. On a miniature railway system it is practically impossible to arrange a station anywhere but alongside straight track. Thus on the average layout there is little choice of position for this important accessory. Even so, care should be taken to ensure that the station looks as though it serves its real purpose, and to avoid the impression that it has simply been planted down anyhow in the middle of a collection of running lines and sidings. The "road" approach to the station should not be invaded by siding tracks, but should be kept clear, so that Dinky Toys vehicles and so on can be used correctly.

Most real stations have a signal box near to them, so it is a safe rule to provide a Signal Cabin near to our Hornby Station, especially if there are any loop lines or sidings branching off the main line. If the station arrangements include a Level Crossing at the platform end the

Signal Cabin should be near the crossing, so that both railway and roadway are under the signalman's observation.

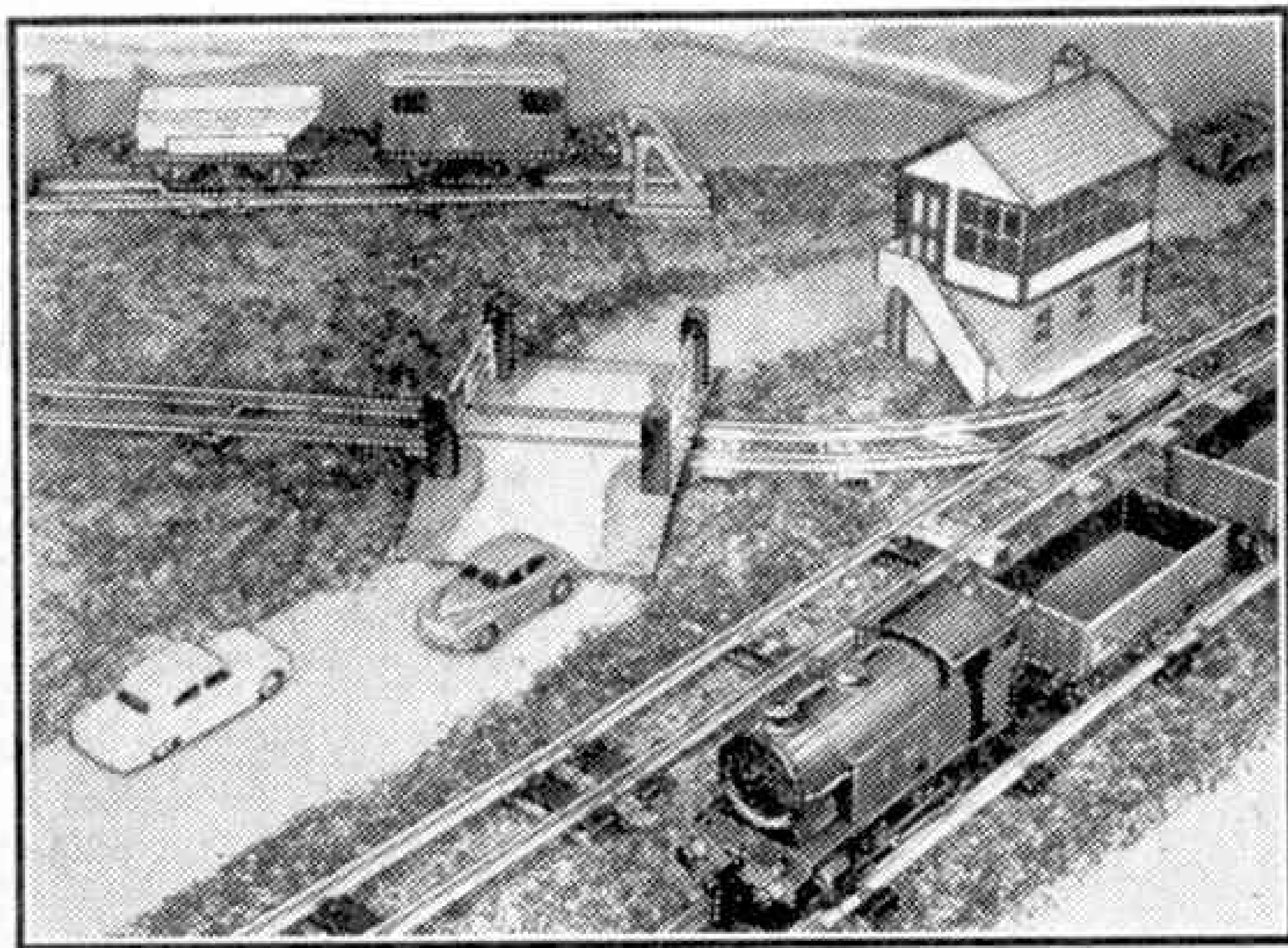


An unusual crossing layout with freight trains passing over it. The signal cabin is well placed in the centre of this busy system.

It is not easy to arrange suitable road effects in the neighbourhood of a Level Crossing, especially if this is used on the main line near to the edge of a table or baseboard. It is not a bad scheme therefore to follow up the arrangement shown in the lower picture on this page. Here the Level Crossing leads a "roadway" over the branch line taken off the main track.

The Signal Cabin is near by and the Dinky Toys cars add to the realistic effect. Crossings in such situations as that shown are often seen, especially when the branch from the main line forms a connection with sidings serving a works or other industrial premises.

Naturally, sidings require to be finished off in the proper manner by buffer stops. The Hornby Buffer Stop is a useful component and fits up to the standard Hornby rails just as any other piece of track. It is important not to omit the connecting plate, as this anchors the Buffer Stop firmly to the track, and will prevent trouble which can arise through vehicles forcing it away from the end of the rails.



A branch line with level crossing leads off from the main running track. The Dinky Toys motor vehicles "on the road" help the realistic effect considerably.

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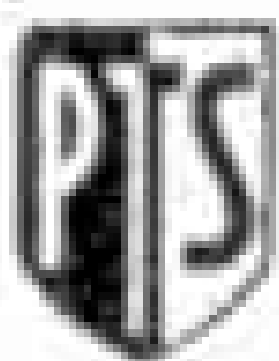
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Stamp Collecting

A Land of History

By F. Riley, B.Sc.

IRAN, or Persia, to use its former name, is the modern representative of the ancient Empire founded 2,500 years ago by the Persian king Cyrus, who conquered Asia Minor and Mesopotamia. His successors extended their sway even farther, and Darius I, who became Emperor in 521 B.C., ruled from the Aegean Sea and Egypt to the borders of India.



The stamps of Iran include one that is a reminder of this ancient glory. It was one of a set issued in 1915 to mark the coronation of Shah Ahmed and depicted Darius on his throne. It is rare to find a country that can include in its stamp designs a picture of a monarch of 2,500 years ago. Egypt seems to be Iran's only rival in this respect. Two ancient rulers of that country have been distinguished by the appearance on modern

Egyptian stamps of reproductions of their statues, and they reigned nearly 1,000 years before Darius. The earlier of these was Amenhotep, who was king about 1,400 B.C., and the other was Rameses II, a great warrior who ruled the country just over 100 years later.

Modern Iran is by no means as extensive as the ancient Empire, but it is an important and interesting country. For the most part it consists of a rocky and desolate plateau, with desert land on one side and mountains on the other. It has large areas of fertile land and its capital, Tehran, is a city of about 600,000 inhabitants. Its chief product to-day is oil, vast quantities of which are yielded by its famous oil wells, while, at Abadan, near the head of the Persian Gulf, there is the largest oil refinery in the world.

The country has also been a prolific source of interesting and colourful stamps since its first effort appeared in 1870. The number of stamps issued during the last few years indeed has been remarkable. Every opportunity of celebrating some great or famous occasion appears to have been seized, and since May of last year alone 30 new stamps have made their appearance, in eight sets.

All the stamps of the 1911-22 set were of the same design, portraying the boy Shah Ahmed. His father, Shah Mohammed Ali, had a short and troubled reign and finally was compelled to abdicate in 1909 in favour of the boy, who in his portrait seems to

have a troubled and almost frightened look, as a glance at the reproduction of one value on this page will show. His coronation set of 1915 included the Darius I stamp



already mentioned, with Iran's first

pictorial, illustrating the ruins of Persepolis, one of Iran's ancient capitals.

Rebellions also marked Ahmed's reign, and finally he was overthrown by Reza Khan Pahlavi, an officer of the Persian Army, who in 1925 became Shah himself under the name Reza Shah Pahlavi. One of the many stamps of his reign shows an eagle, with the Elburz Mountains in the background. More pictorials followed in further issues, and the year 1933 also saw a change in currency, the existing chahis, krans and toman giving way to dinars and rials, 100 of the former making one of the latter. Later the marriage of the Crown Prince to Princess Fawzieh, the sister of the Khedive of Egypt, was celebrated by the Royal Wedding Set of 1939, on which were shown portraits of the Crown Prince and Princess.

In his turn Reza Shah Pahlavi encountered trouble. In the early years of the war Russian and British troops occupied Iran in order to make sure that the country did not become a centre of German activities, and the Shah was deposed. His association with

the stamps of Persia did not come to an end then, however. When he left Persia he settled in Johannesburg, where he died in 1944, and in May 1950 his body was brought back with great pomp and

ceremony for internment in a mausoleum that had been built in a village a few miles to the south of Tehran. This event was marked by the issue of a special set of two stamps illustrating the mausoleum and bearing a portrait of the deposed Shah.

The first set of the new Shah, Mohammed Reza Pahlavi, was a very long one of 29 stamps, with several values represented. His 31st birthday was celebrated in October of last year by a set of six stamps, showing the Shah himself in uniform at different ages. Last February the issue of six stamps celebrated his marriage, the design showing portraits of the Shah and his bride. A little earlier a special issue had been made to commemorate the re-establishment of control in Azerbaijan, the northern province of Iran, where disturbances had taken place. One stamp of this set showed a map of the country, others depicting troops and a battle scene.

Other events celebrated recently by the appearance of stamps have been the 75th anniversary of the Universal Postal Union—this set did not appear until March 1950—an Economic Conference of Islamic countries, and the millenaries of Ibn Sina, better known as Avicenna, a famous doctor and philosopher of 1,000 years ago, and Farabi, an Arab philosopher who appears to have had little direct association with Iran.



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Stamp Gossip and Notes on New Issues

By F. E. Metcalfe

"AREN'T those stamps just like those of Monaco." That is a remark made in the hearing of the writer of these notes, when a collector saw the commemorative stamps that Australia brought out on 1st May. Actually a great compliment was being paid to these stamps, for Monaco is producing some of the most beautiful stamps in the world. The point is, however, who would have thought that such an observation would have been made about Australian stamps, for there was a time when no country was producing

issues more dull or inartistic.

It has to be admitted at once that two of the four stamps—a good average—that came out at the beginning of May



deserved the compliment, and the designs of these stamps are well worth careful examination. Let us take the 5d. stamp first. Just look at those tiny engravings of the then Duke and Duchess of York, who later became King George V and Queen Mary. They are only about half an inch in height and the heads are no longer than those to be found on a pin; yes, real pin heads. Yet the likeness is so good that it is quite easy to see, even with the naked eye, who are being depicted. Examine also the multitude facing the platform; then take a magnifying glass, and see how that wonderful effect has been obtained with very few lines indeed.

Even more notable still is the 1/6d. value. Taken as a whole the design is very pleasing, yet the artist has obtained this effect while having to deal with the dullest of all subjects, a long rambling building. It would be almost impossible to find a subject more difficult to deal with if one is to make a pleasing picture, but this is what was accomplished in this case. Look at the trees that flank the picture; for those who happen to know the species there will be no difficulty in recognising what they are. Note also the Norfolk Island pines along the front of the building itself, and don't overlook the flag, which is true to a line.

Altogether a fine piece of work and Australia is to be congratulated on it. Its engraver, whoever he may be.

The stamps themselves commemorate an important occasion, the Jubilee of the Commonwealth. In addition to the two stamps illustrated, a pair set tenent bear the portraits of Sir Henry Parkes, who played such an important part in bringing about the federation of the Australian states, and Sir Edmund Barton, who was the first Prime Minister of the Confederation, the Commonwealth of Australia. These stamps are going to provide a welcome link between



Australian stamp collectors and those in other parts of the British Commonwealth of Nations.

A reader has asked why there are two different stamps of Somaliland Protectorate surcharged 2s. He was referring to the set that came out at the beginning of April. Well there is quite a story attached to it. Over a year ago it was decided to change the currency of this territory from annas and rupees to

cents and shillings, and so that postage stamps might be in line it was arranged for the former to be surcharged. But stocks of 1/4a, 1a, 2r. and 3r.



stamps were small, so the two low values were surcharged 5c. and the two high ones 2r. To avoid confusion only the 1/4a. and 2r. stamps were to be put on sale to begin with, and the other two stamps were to be kept in reserve until the first were used up. The postal authorities in Berbera had evidently misunderstood this, however, and in error the 2r. and 3r. overprinted 2s. were placed on sale together.

Imagine the surprise of some dealers, when they received their supplies from the Protectorate, to find those two stamps in their parcels. Of course, dealers who had ordered in London from the Crown Agents, only received the 2s. on 2r. It was only natural that they made a bit of fuss, so the Crown Agents had to release supplies of the 2s. on 3r. as well. This resulted in the anomaly of two different stamps of the same face value being on sale at once.

There are many collectors of modern U.S.A. commemorative stamps and it was disappointing to them when it was learned that during 1951 only four new stamps were to be issued. Some time ago the American Post Office was given the last word as to whether new stamps were to be issued or not. Cutting down of new issues was the inevitable result, for what Post Office in the world wants to be bothered with new stamps? We all remember the puerile excuses our own Post Office made in the old days.

Never short of an excuse, the reason given why America cannot bring out more new stamps in a year was said to be re-armament. Seeing that China brings out quite a few stamps every week, one would have thought that a better excuse could have been thought up; anyhow American collectors are not as supine as they are here at home, and it now looks as though they will get a few more commemoratives than the U.S. Post Office wished to issue.

The last illustration this month is of a stamp that may look an old one, but is actually quite new. Collectors of Peruvian stamps, and they are many, will know this stamp, for one of a similar design came out several years ago, but what a history it has. The British firm of printers Waterlow and Sons Ltd. first produced these stamps; then the job was given to an American firm; once more Waterlow's got it; and now the printers are the Institute of Gravure, Paris. The different printings can easily be distinguished, for the printer's name is at the base of the stamps.



Competitions! Open To All Readers

Prize-winning entries in "M.M." competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.

Seen on the Road

Most readers of the "M.M." are keenly interested in motor lorries and motor cars, and are able to recognise practically all makes on the road at a glance. With this in mind our chief competition this month is concerned with commercial vehicles.

In the panel on this page is a list of 12 clues. Each of these, when properly worked out, will give the reader the name of a motor lorry. In most cases the name to which the clue directs the competitor is that of the firm making the vehicle, but entrants should look out for the names of particular makes where these are not the names of the makers themselves. With any examples of this kind the name of the firm should be given in the solution as well as that distinguishing the vehicle.

When the names of the commercial

vehicles indicated by these clues have been discovered entrants should write them out in the form of numbered lists, which should then be sent in, addressed "*Commercial Vehicles Name Contest, Meccano Magazine, Binns Road, Liverpool 13.*"

In this competition there will be separate sections for Home and Overseas readers respectively, and in each section prizes of 21/-, 15/- and 10/6 will be awarded for the three best entries in order of merit. Consolation prizes also will be awarded for other deserving efforts, and if there is a tie for

any prize the judges will base their decisions on the novelty and neatness of the entries concerned.

The closing dates in this contest are 31st August in the Home Section, and 30th November in the Overseas Section.

1. Think of a well-known pre-war small family car.
2. Made in Scotland.
3. Do this to avoid capture.
4. Sounds something like a pause.
5. This is not really an eight-armed cuttlefish.
6. A special kind of dancing.
7. Many boys have this name.
8. Features a Red Indian.
9. An angry meadow.
10. What could the girl kill?
11. Stands on guard.
12. The small farm seems prickly.

You Should Know These

In the many years of the history of railways in this country what can almost be described as a new language has come into use, that of our railwaymen. For instance, on the line itself you will hear platelayers speaking of a "Jim Crow," by which they mean the appliance used for bending rails. This naming covers not only features of the track and of stations, but also locomotives, coaches and goods vehicles in wide variety, and it is with names of this kind that our competition is concerned.

Below we give 10 questions, each of which is concerned with some example of railway language, and entrants are asked to tell us what the words given mean and to explain the circumstances in which they are used.

1. What is an "Insixfish"?
2. Which class of engine is known as a "Star"?
3. What is a "Shocvan"?
4. Which railway was known as the "Lanky"?
5. A certain type of brake van is known as a "dungeon." Can you identify it?
6. Which engines are known as "Black Motors"?
7. What railway is known as the "Dockers' Umbrella"?
8. What is a "Ballast brake"?
9. What is known as "Char"?

10. In Scotland which engines are known as "Barneys"?

Entrants in this competition should send in a numbered list of replies, making these as full as is necessary for complete explanation, but otherwise keeping them as short as possible. They should be addressed "*July Railway Words Competition, Meccano Magazine, Binns Road, Liverpool 13.*"

As usual, there will be separate sections for Home and Overseas readers, and in each of these prizes of 21/-, 15/- and 10/6 will be awarded, with consolation prizes for other efforts that just fall short of prize-winning standard. Closing Dates: Home Section, 31st August; Overseas Section, 30th November.

July Photographic Contest

The seventh of our 1951 series of photographic contests is a general one in which we invite readers to submit prints of any subject. Each competitor may submit only one photograph, which must have been taken by him, and on the back of his print must be stated exactly what the photograph represents.

The Competition will be in two sections, A for readers aged 16 and over, and B for those under 16. Each competitor must state in which section his photograph is entered. There will be separate Overseas Sections, and in each section prizes of 21/-, 15/- and 10/6 will be awarded. Entries should be addressed "*July Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13.*" Closing Dates: Home Section, 31st July; Overseas Section, 31st October.

Competition Results

HOME

JANUARY 1951 COVER VOTING CONTEST

1st Prize: J. Nelson, Milnthorpe. 2nd Prize: P. T. Paige, Whitchurch. 3rd Prize: W. F. Kellett, Liverpool 13. Consolation Prizes: P. Sample, Bletchley; A. E. Morris, Kenton; A. D. Jackson, Waresley; C. Blundell, Hutton; V. Horn, Stogumber; V. Hinchliffe, Stockport.

JANUARY 1951 LOCOMOTIVE PAINTING CONTEST

1st Prize: R. Yates, Hounslow. 2nd Prize: A. J. Reed, Aylesbury. 3rd Prize: P. Morath, Greasby. Special Editorial Prizes: Mrs. M. Farnell, Harrow Weald; D. J. F. Luckhurst, Sevenoaks. Consolation Prizes: M. H. Poole, Brimscombe; I. Mayes, Coventry; J. Dewey, North Chingford; J. Chaplin, Leicester; R. Francis, Crewe.

FEBRUARY 1951 DRAWING CONTEST

1st Prize, Section A: R. C. Taylor, Sheffield 11; Section B: M. Collins, Kingston-on-Thames. 2nd Prize, Section A: J. Bird, Chard; Section B: I. MacDiarmid, Dundee. 3rd Prize, Section A: R. Martin, Ewhurst; Section B: M. Donaldson, Whitehaven. Consolation Prizes, Section A: A. Mayor, Kendal; P. Horton, Keighley; C. Bean, Belfast; Section B: E. M. Foster, Totnes; C. Briam, Keighley; P. M. Stoneham, Barrow-in-Furness.

FEBRUARY 1951 RAILWAY QUIZ

1st Prize: J. G. Todd, Glasgow E.2. 2nd Prize: D. Kitchen, Rugby. 3rd Prize: W. E. Humphreys, Hanley. Consolation Prizes: D. V. T. Hampson, Formby; M. Judd, Portchester; P. R. Parry, London S.W.19.

FEBRUARY 1951 PHOTOGRAPHIC CONTEST

1st Prize, Section A: C. E. Willits, North Shields; Section B: P. H. Lamb, Reading. 2nd Prize, Section A: P. F. Chapman, St. Leonards-on-Sea; Section B: M. S. D. Sullivan, Framlingham. 3rd Prize, Section A: V. G. Earley, Bradford; Section B: J. B. Killingbeck, Taunton. Consolation Prizes, Section A: W. R. H. Temple, Upminster; T. Jones, Wrexham; G. N. Wright, Bath; H. S. Lamb, Reading; G. Haddock, Rhondda; C. F. Jones, Keynsham; Section B: P. Warlow, Plymouth; G. D. Temperley, Cudworth; M. G. Harrison, Esher; G. Muscutt, Hastings; R. Morgan, Cærlleon; J. Lord, Bewdley.

MARCH 1951 PHOTOGRAPHIC CONTEST

1st Prize: Section A: B. I. Nathan, Sevenoaks; Section B: M. G. Harrison, Esher. 2nd Prize, Section A: W. E. Silvester, London S.E.26; Section B: D. E. Hirst, Ilford. 3rd Prize, Section A: R. D. Barrett-Lennard, London S.W.1; Section B: G. Smith, Basingstoke. Consolation Prizes, Section A: F. Watson, Newcastle-on-Tyne; A. Sunderland, Whitehaven; C. F. Firminger, London S.E.18; L. Wilkinson, Preston; P. J. Street, Southampton; Section B: D. C. Young, Pitlochry; P. A. Smith, Watford; N. Richards, Coseley; P. L. Taylor, Liverpool 18. T. C. Gilbertson, Lincoln; Wm. A. C. Toft, Manchester; H. Roberts, Northwich; G. Leonard, Blackburn; A. N. Jones, Liverpool.

MARCH 1951 PRICE CODE CONTEST

1st Prize: A. P. Connelly, Dartford. 2nd Prize: C. Williams, Chester. 3rd Prize: D. T. Willars, Nuneaton. Consolation Prizes: R. H. McDougall, Perth; P. A. Duckworth, Wigan; J. M. Miles, Coventry; E. C. A. Guiver, Southend-on-Sea.

MARCH 1951 RAILWAY SCENE CONTEST

1st Prize: K. Naylor, Halifax. 2nd Prize: B. Wilkinson, Kettering. 3rd Prize: C. Wilde, Manchester. Consolation Prizes: D. Albon, Halifax. G. Hird, Willerby.

APRIL 1951 PHOTOGRAPHIC CONTEST

1st Prize, Section A: E. V. Wheeler, Lymington; Section B: P. B. Browning, Edinburgh 10. 2nd Prize, Section A: P. R. Starbuck, Gravesend; Section B: L. Ravenscroft, Weymouth. 3rd Prize, Section A: J. Murray, Wishaw; Section B: R. Haddon, Isle of Arran. Special Editorial Prizes: A. B. Mills, Upton; H. B. Webb, London N.8. Consolation Prizes, Section A: Miss P. Bee, Dudley; D. M. Laugharne, London E.17; P. J. Jones, Penmænrhos; E. J. Elphick, Hastings. Section B: D. W. Edwards, Exeter; L. A. Hare, Pudsey; S. M. Armitage, Wakefield; T. C. Leeks, Hadleigh.

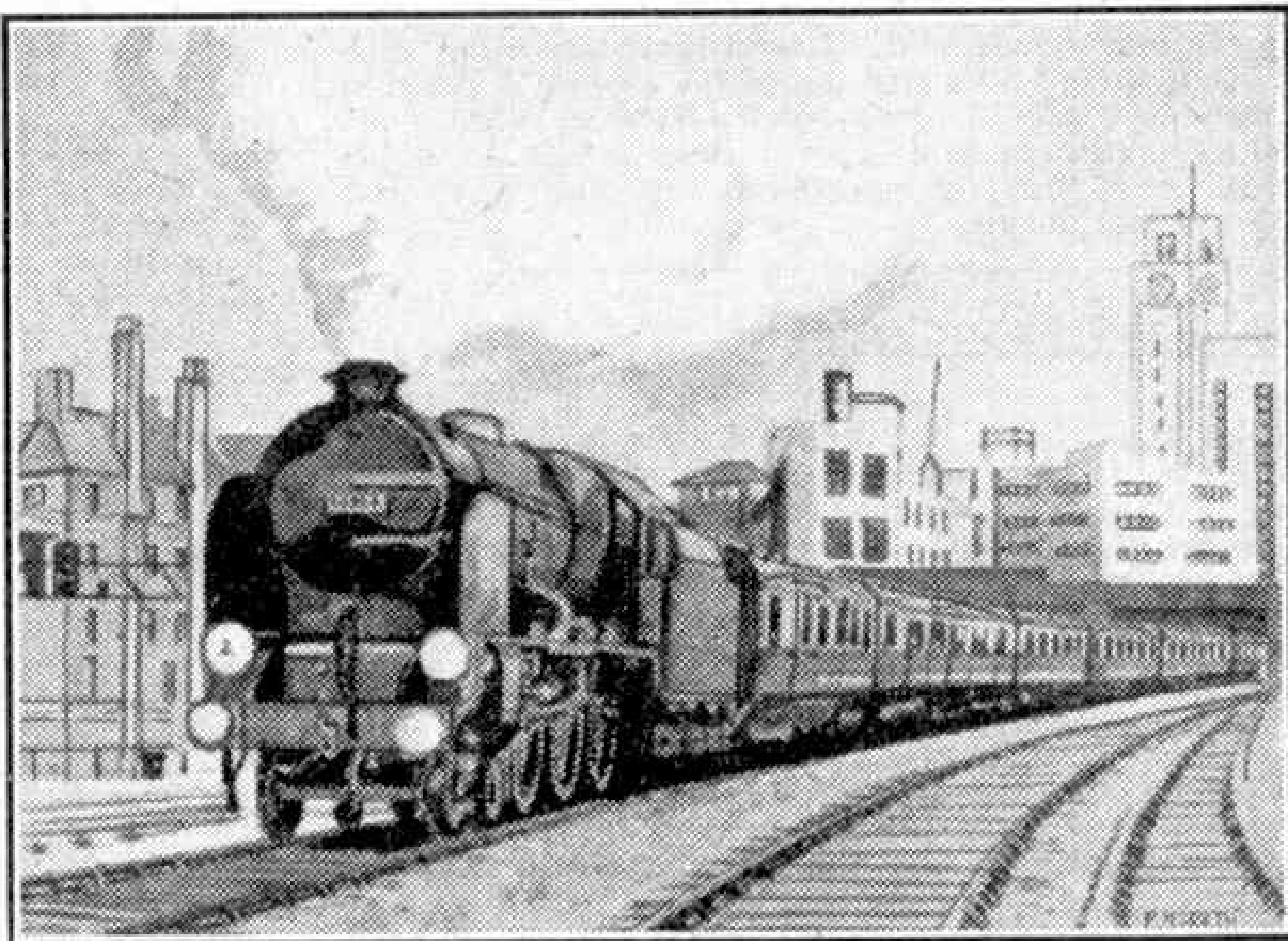
OVERSEAS

NOVEMBER 1950 FIGUREWORD CONTEST

1st Prize: M. Bashir, Mbale, Uganda. 2nd Prize: R. Kirk, Whakatere, N.Z. 3rd Prize: S. J. C. Johnson, Freetown, Sierra Leone. Consolation Prizes: R. Stewart, Timaru, N.Z.; R. E. Matthews, Alliance, Canada; G. Keuck, Bellville, S. Africa.

NOVEMBER 1950 LOCOMOTIVE NAMES CONTEST

1st Prize: R. R. Howard, Greymouth, N.Z. 2nd Prize: J. Dawson, Nairobi, Kenya. 3rd Prize: P. S. Beech, Bombay, India. Consolation Prizes: B. J. Kirkwood, Christchurch, N.Z.; D. Stanmore, Dublin, Eire. J. K. Illingworth, New York, U.S.A. P. L. Plumber, Brisbane, Australia. I. H. Potter, Auckland, N.Z. J. W. Pepper, Ontario, Canada.



Peter Morath, aged 13, submitted this fine water-colour painting for the January 1951 Locomotive Painting Contest. The entry, awarded 3rd Prize, is typical of the high standard of work entered for this contest.

Exploring the Menai Strait—*(Continued from page 297)*

part floats, with the remainder suspended below.

The fishermen now divide into two teams and start hauling in the net, with the hope that there is at least one salmon in it. This heavy work calls for great skill as well as much muscular effort. Although a salmon may be trapped in the net, he will jump out of his trap if his suspicion is aroused. If no fish happens to be present, then with a sigh the net is carefully repacked into the boat. One man again remains behind, with his rope attached to one end of the net, while the others go out on their circular course to spread their net for another attempt.

H.M.S. "Conway," moored in midstream just off Port Dinorwic, is a nautical training school for Merchant Navy Officers. This illustrious frigate, formerly the "Nile," saw service in many parts of the world before the Admiralty placed her at the disposal of the Council of the Mercantile Marine Service Association for use as a training ship. She reached the Mersey in 1876, and remained there until 1941, when two tugs and a destroyer brought her to the Menai Strait to seek refuge from the German bombs that were then falling on Merseyside. She was first anchored off Bangor, but on 12th April 1949 another move took place, this time the short but hazardous journey of three or four miles from Bangor to new moorings at Plas Newydd, off the Anglesey shore.

Giant Overhead Travelling Crane—*(Continued from page 301)*

being sufficient to allow one of the main trolleys to be lifted between them. This was raised high enough to clear the main girders, which were then closed in to the required distance, so that the trolley could be lowered on to its track. The second trolley frame was assembled complete, without its mechanical gear. It was then lifted endways between the girders, righted and set down, after which the mechanical gear was assembled. Lastly the derrick used in these operations was dismantled.

The crane is of substantial construction throughout, and special care has been taken to allow access to all parts for inspection and lubrication. The trolleys and the motors and mechanism installed on them, can easily be reached from timber platforms on the top level of the girders of the crane, and platforms along the bottom level of one girder unit give access to the long travel gear. The driver is provided with a cabin slung under one end of the girders, a position that allows him an unobstructed view of crane loads in any position; and a steel rung ladder from his cabin leads to the compartment carrying the electric control equipment.

The Battery Electric Vehicle—*(Continued from page 308)*

which then drives the vehicle in the first half-speed position. If extra speed is then required the batteries can be automatically connected in series simply by pressing a push button on the steering column. This doubles the voltage applied to the motor and increases the speed correspondingly. A starting resistance is still used to limit the initial current surge, but this is only in circuit momentarily while starting and does not needlessly waste energy. All the automatic control is carried out by a panel of six small electrically operated contactors, mounted in a cabinet in the cab.

Electric vehicles are moderately slow compared to the petrol type, their speed being of the order of 15 to 18 m.p.h., but many tests have shown that an electric truck can cover a normal delivery round, with say 200 stops, much more quickly than can a petrol van capable of travelling at twice the speed. This is due to the remarkable nippiness and very rapid acceleration of the electric, and of course the

lack of gear changes associated with the petrol vehicle. Again, in towns the latter is never able to reach maximum speed, traffic streams usually travelling at about 10 to 15 miles per hour.

The range of an electrically propelled vehicle varies according to the service conditions and the nature of the district, and is naturally reduced in hilly areas. In the best conditions the available range on each charge is from 25 miles up to a maximum of 35 or 40 miles. While this distance may sound rather limited, it is a remarkable fact that delivery rounds rarely exceed 30 miles or so and are therefore well within the capacity of the battery electric. A greater mileage can only be provided by fitting a larger battery, but this is uneconomic, as the increased weight of the battery drastically reduces the load that can be carried. For this reason an electric is not recommended for long-distance work, or as a private car, attractive as this may seem in view of the high cost of petrol and the long delivery on other types of private and commercial vehicles.

Apart from the trades mentioned above, there are other more specialised services for which the modern electric vehicle is ideally suited and is being increasingly used. These are the collection of household refuse and street sweepings, repair and maintenance of overhead lines and street lamps, and the work of all kinds that involves short runs and frequent stops within a limited radius.

"Forewarned is Forearmed"—*(Continued from page 315)*

in our factories. Volunteers from the Corps served as aircraft spotters aboard Allied assault and supply ships during the D-Day landings in Normandy, so earning the right to wear the coveted "Seaborne" shoulder flash. Last, but by no means least in importance, the Corps earned the undying gratitude of every branch of the Royal Air Force by maintaining a constant vigil to nurse home our own crippled bombers and fighters, and other aircraft lost or in distress, a service which saved the lives of countless young airmen.

To-day the Royal Observer Corps is again in the forefront of our defence forces, for experience in war and peace has shown that radar has serious limitations, whereas no enemy could hope to elude the alert watchfulness of the 15,000 unpaid men and women in R.A.F. blue who form the present R.O.C. That certainty might help to prevent another war; it could also mean the difference between survival or defeat if war came.

New Meccano Model—*(Continued from page 323)*

the other 2" and 1" loose Pulleys, and is tied finally to Rod 18. The hoisting Cord is passed over the 1" loose Pulley on Rod 18, and round a 1½" Pulley at the jib-head.

The roof is assembled from two 9½" and two 7½" Angle Girders, and is plated by two 9½" Strip Plates and two 5½" x 2½" Flexible Plates arranged to leave a gap for the operating Cords.

Parts required to build model Shipyard Crane:
8 of No. 1; 4 of No. 1a; 16 of No. 2; 22 of No. 2a; 15 of No. 3; 8 of No. 4; 11 of No. 5; 8 of No. 6; 12 of No. 7a; 14 of No. 8a; 8 of No. 8b; 2 of No. 9; 2 of No. 9a; 8 of No. 9d; 1 of No. 13a; 4 of No. 15; 1 of No. 15a; 1 of No. 15b; 3 of No. 16; 2 of No. 16a; 2 of No. 16b; 8 of No. 17; 1 of No. 18b; 2 of No. 20a; 8 of No. 20b; 1 of No. 21; 2 of No. 22a; 6 of No. 24; 3 of No. 26; 4 of No. 27a; 268 of No. 37; 14 of No. 37a; 51 of No. 38; 1 of No. 40; 1 of No. 46; 8 of No. 48; 13 of No. 48a; 1 of No. 57b; 37 of No. 59; 2 of No. 62; 3 of No. 63; 2 of No. 70; 2 of No. 72; 9 of No. 94; 1 of No. 95; 1 of No. 96a; 2 of No. 108; 1 of No. 109; 15 of No. 111c; 2 of No. 118; 4 of No. 125; 4 of No. 126; 4 of No. 126a; 12 of No. 133; 4 of No. 133a; 1 of No. 162; 1 of No. 166; 2 of No. 179; 12 of No. 189; 2 of No. 190; 4 of No. 191; 4 of No. 192; 4 of No. 196; 1 E20R Electric Motor.

Fireside Fun

"If I have 100 potatoes and sell Mrs. Green 75 of them, what is the difference?"
 "That's what I say, miss. Who cares?"



"I didn't think it was so slippery."
 "Well, you soon tumbled to it, Dad!"

"And you sailors do your own washing, I suppose."
 "Oh, no, mum. We just throw our things overboard and they are washed ashore."

"You know, every storm creates a record."
 "I don't see that. The last one we had wasn't as bad as some I remember."
 "But it blew down trees that had never been blown down before, didn't it?"

"Now, Jones, tell me what lightning is."
 "Electricity that you don't have to pay for, sir."

"I say, Smith. I wish you would tell your Johnny not to mimic me. It's very annoying."
 "Why, certainly, Brown. Johnny, just stop behaving like a fool."



"You mustn't do that, Gerald."
 "Why not?"
 "Only ladies use powder; gentlemen wash themselves."

BRAIN TEASERS HALF A CROSSWORD

To begin with this month we have a simple "crossword" that has clues in one direction only, namely vertically. The clues to the seven four-letter words required are as follows:

1, Suspend; 2, Always; 3, Govern; 4, Sailing Ship; 5, Reflect; 6, Bellow; 7, Ancient City.

1	2	3	4	5	6	7

If you have found the right words the top and bottom lines will reveal two Christian names.

A CORNY PUZZLE

A rat discovered a few ears of corn in an old box and decided to take them to his hole. He made 15 journeys, bringing away three ears each time. How many ears of corn were there?

EASY IF YOU KEEP COOL

Here is one that you can try on your friends, with a time limit—after you have solved it yourself!
 How many minutes is it past 12 if 74 minutes ago it was half as many minutes past 11? M.B.



"If it will stop you crying, here's half-a-crown to help to pay for the window you broke. Whose was it?"

"Ours, Dad."

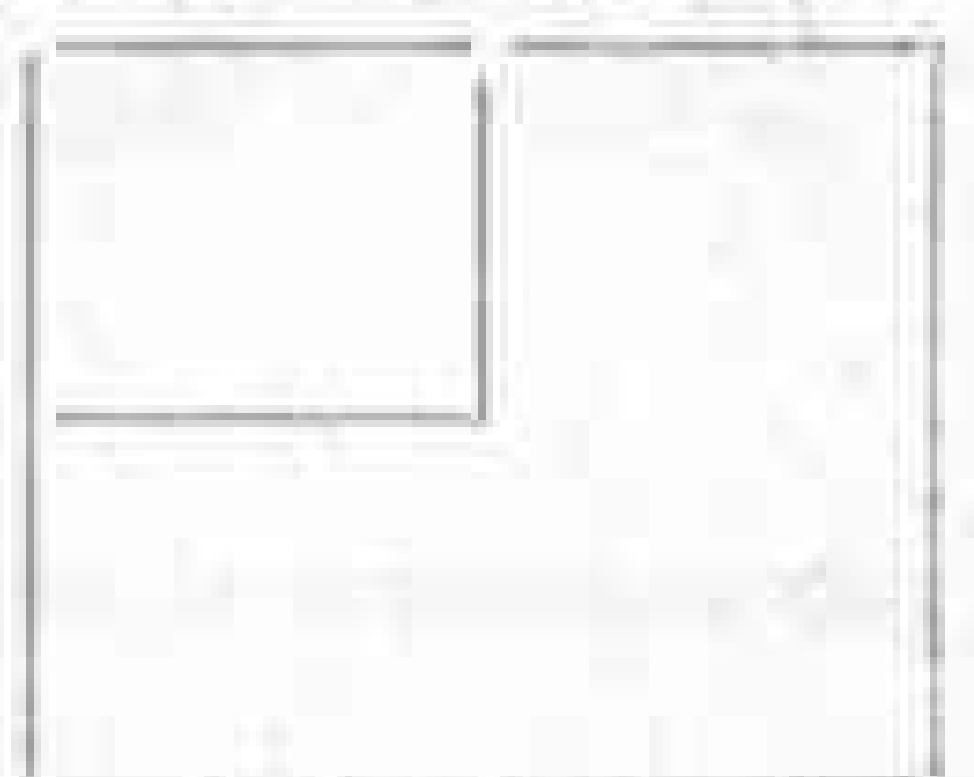
SOLUTIONS TO LAST MONTH'S PUZZLES

The correct bill asked for in our first puzzle last month is as follows:

	£	s.	d.
17 Notepads @ 1/2		19	10
54 Pens @ 9d.	2	0	6
28 Books @ 2/3	3	3	0
	£6	3	4

In our second puzzle the three matches on the right are removed and two of those making the diagram are changed in position to, give the result shown below on the right.

The lowest number that can be expressed as the sum of two cubes in two different ways is 1729. This is the sum of the cubes of 12 and 1, and also of the cubes of 10 and 9. If you have a few years to spare try to find the corresponding number for fourth powers; this must be a very large one.



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never meet
REG HARRIS...*



*riding
anything
but*

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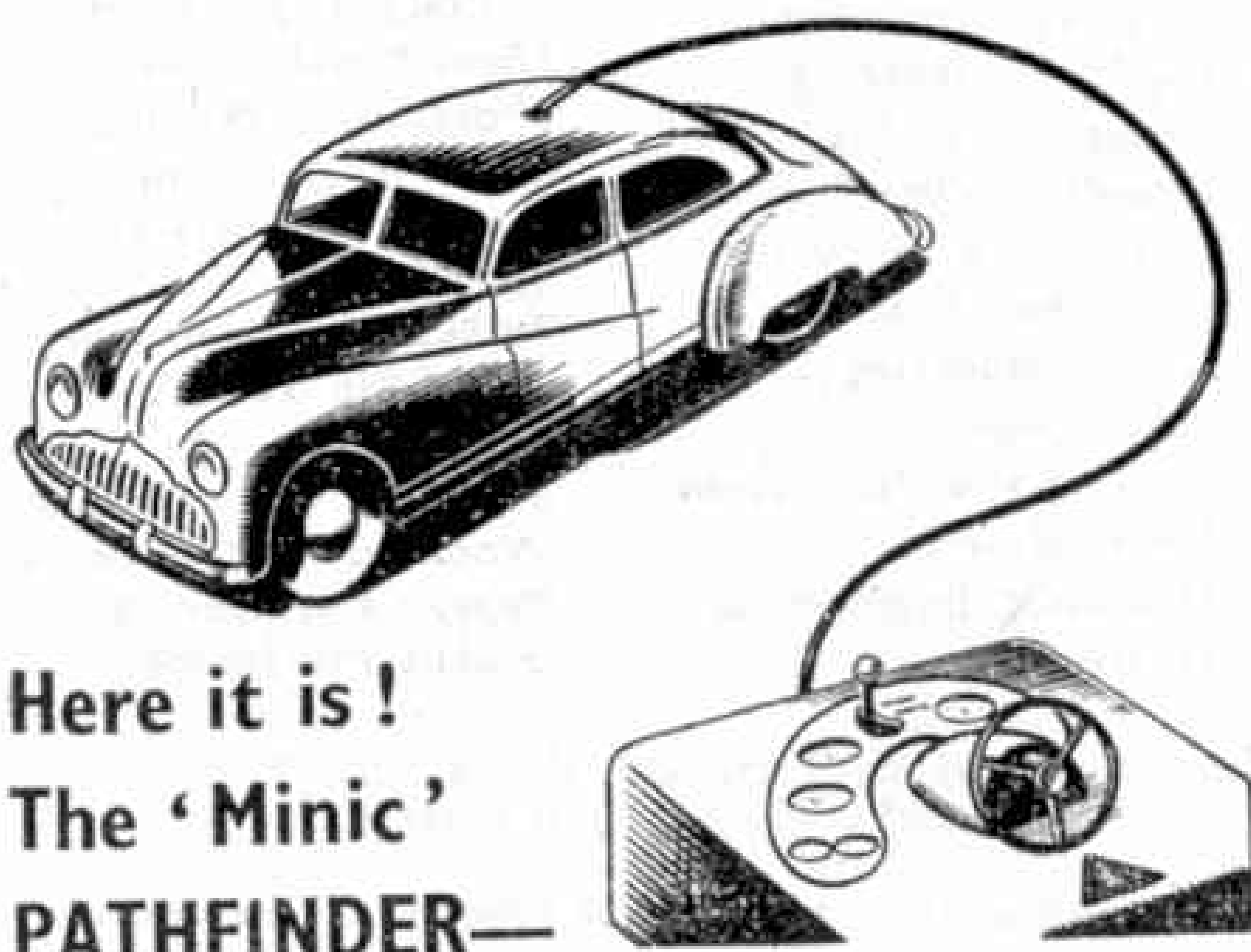
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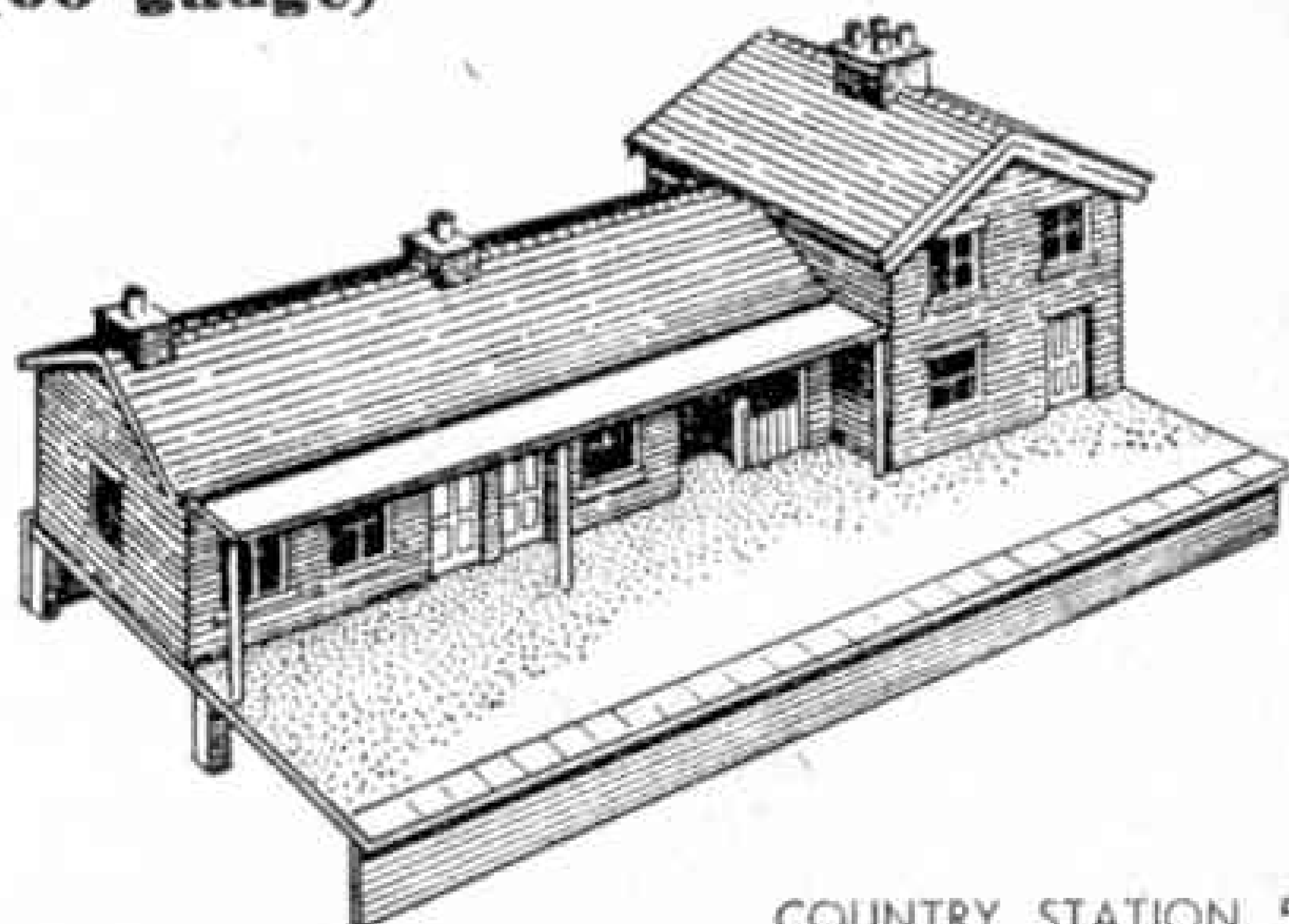
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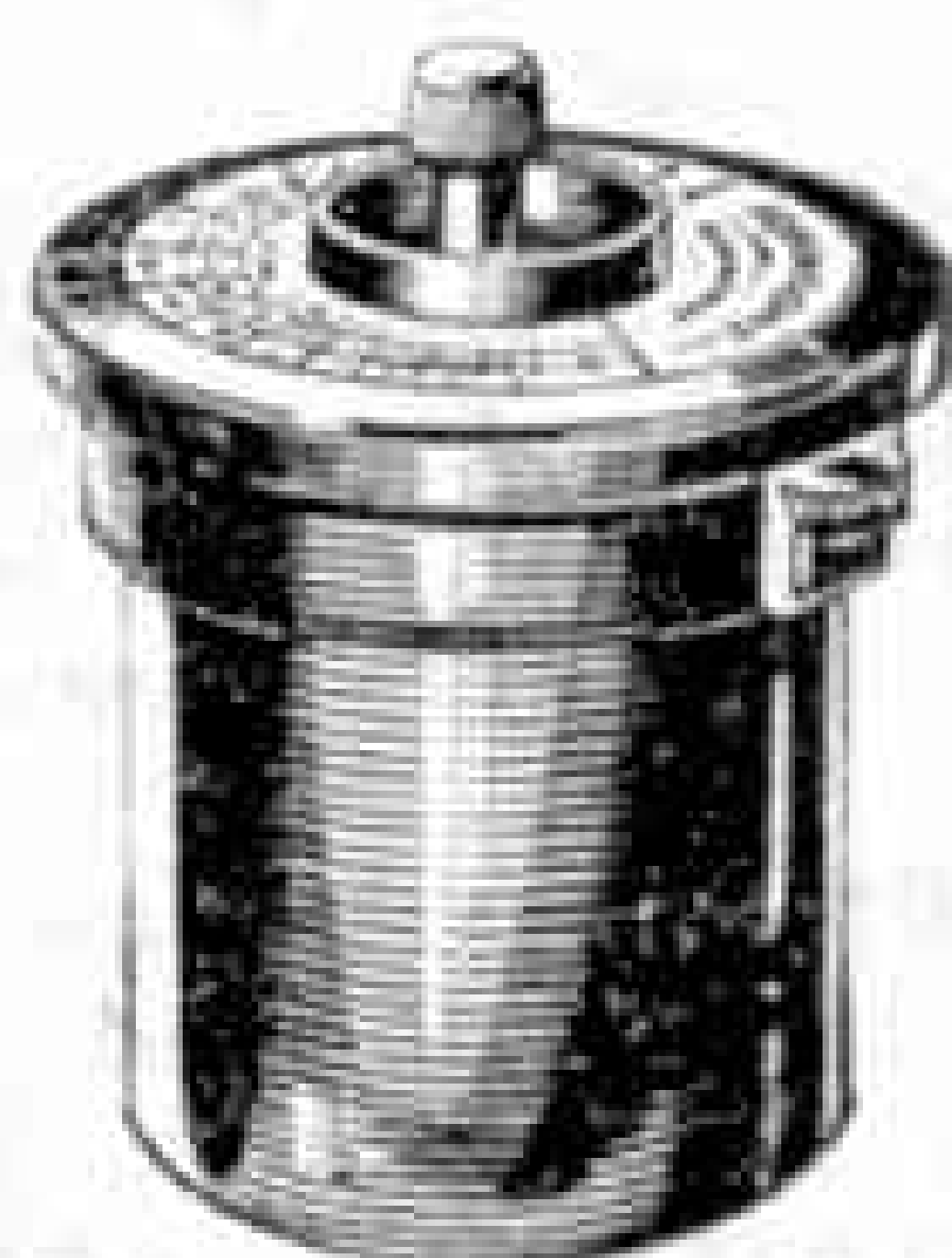
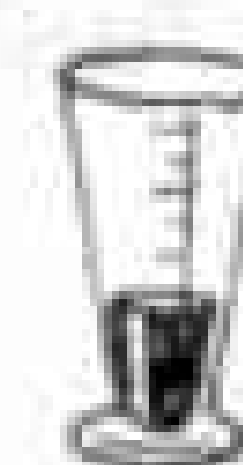
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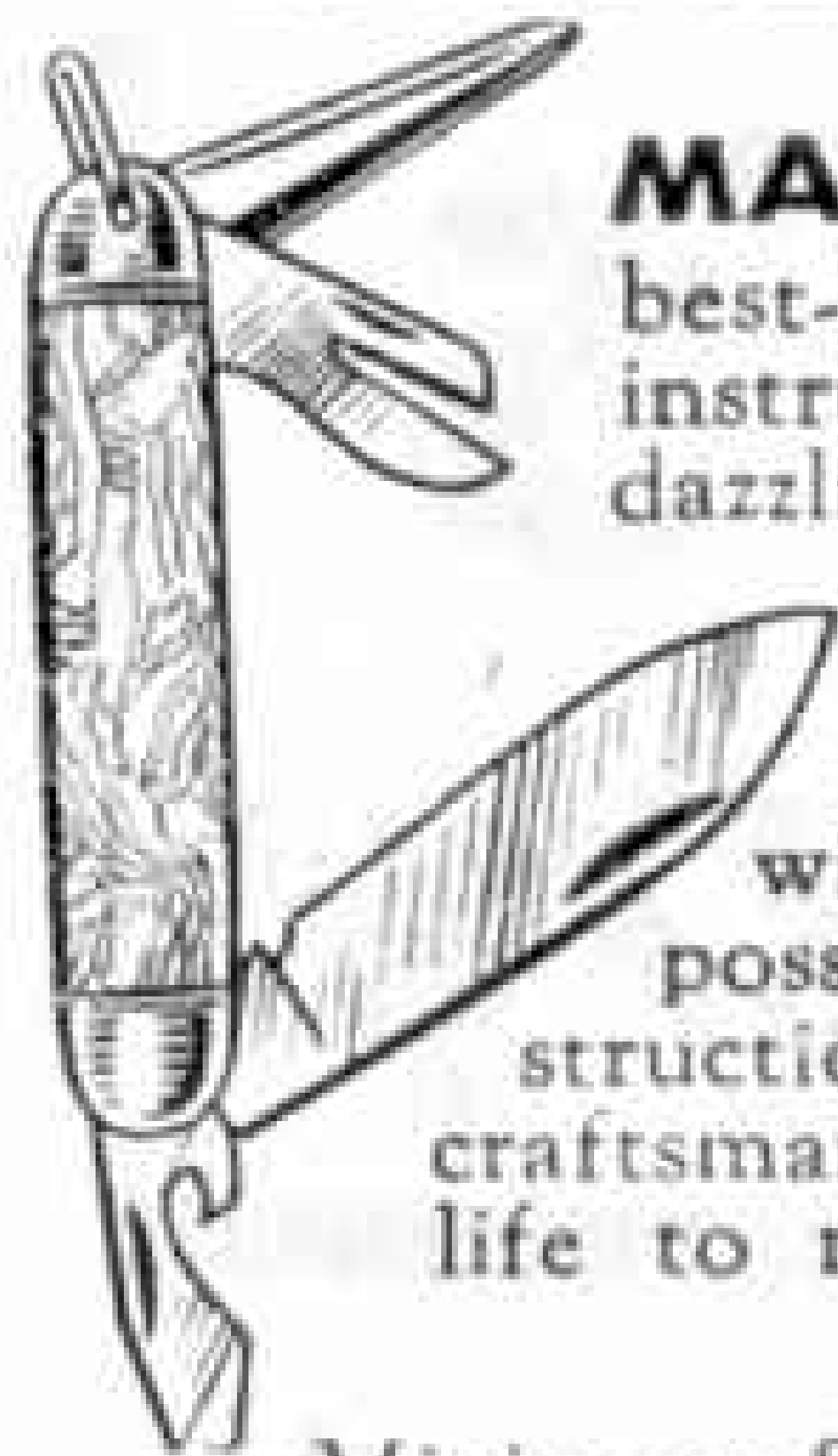
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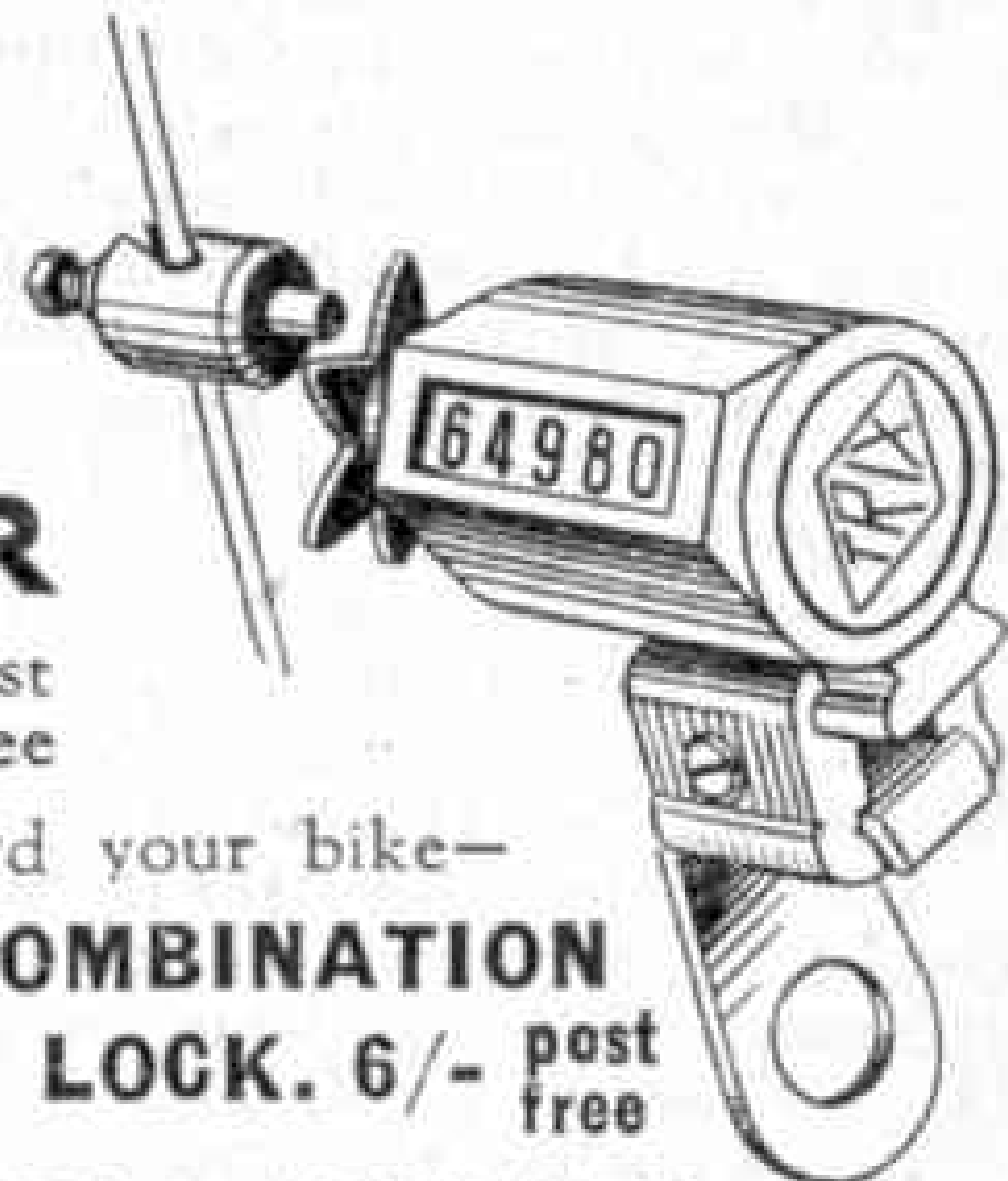
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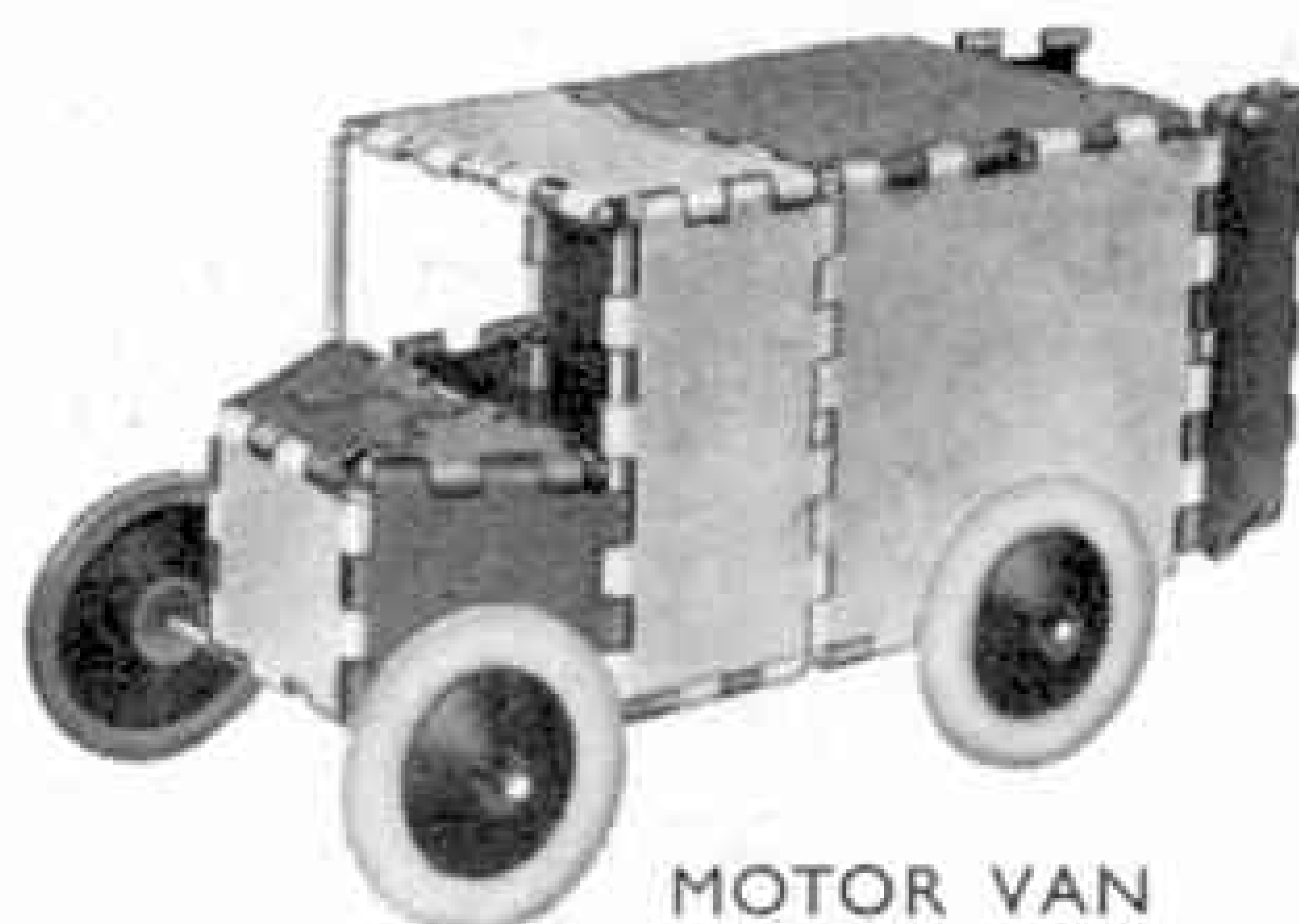
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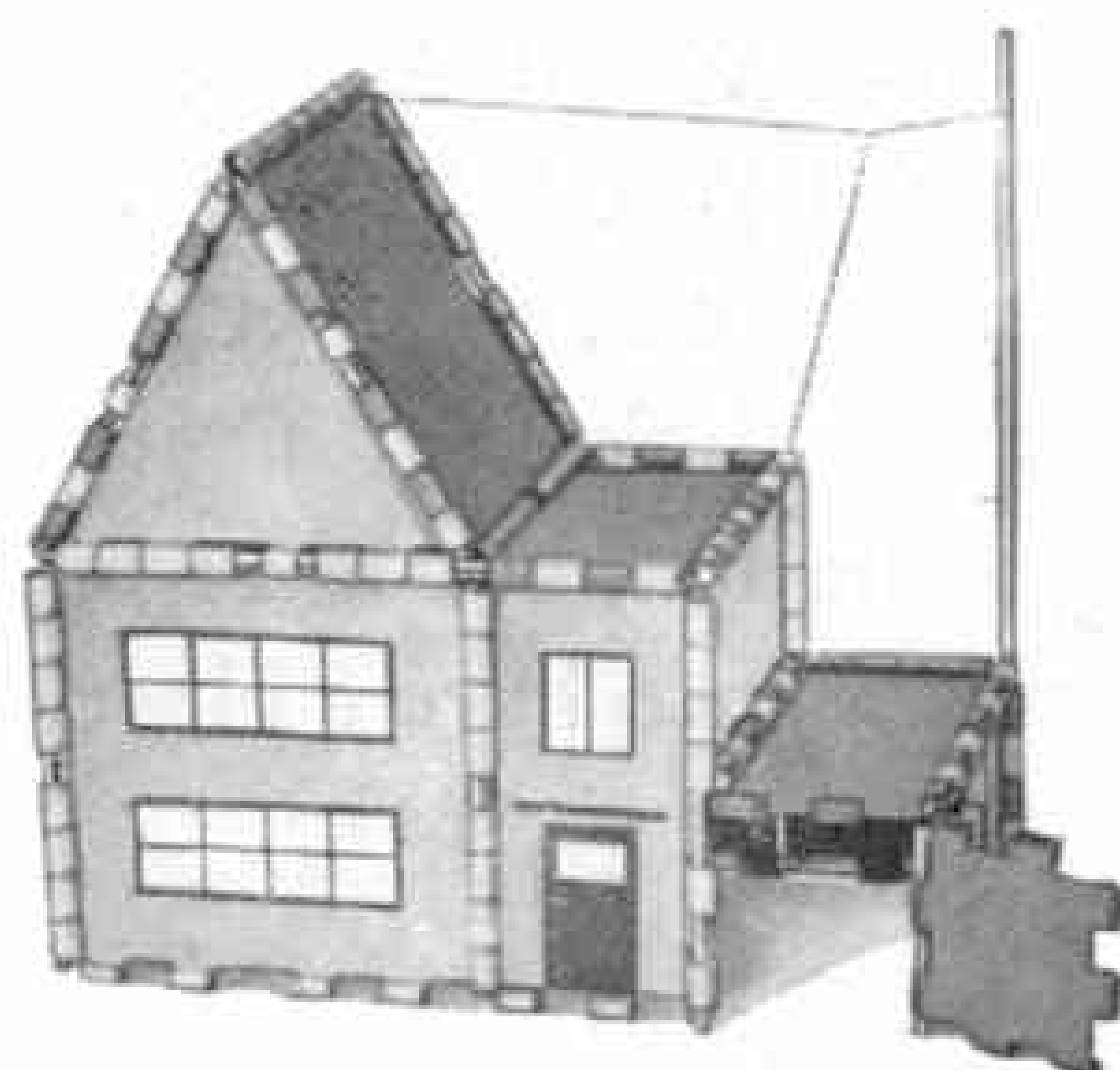
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